

SUPPLEMENT.

The Mining Journal, AILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

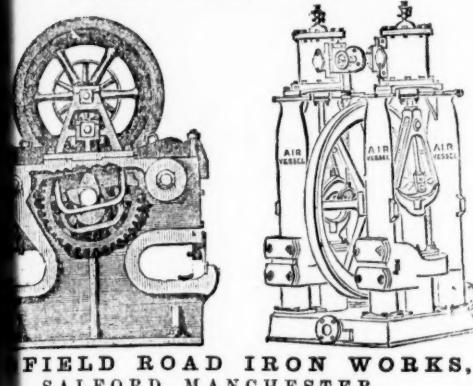
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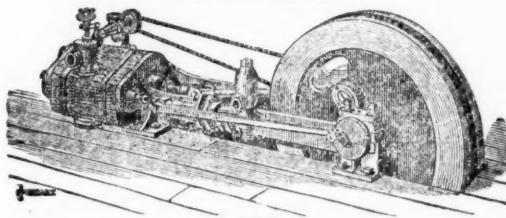
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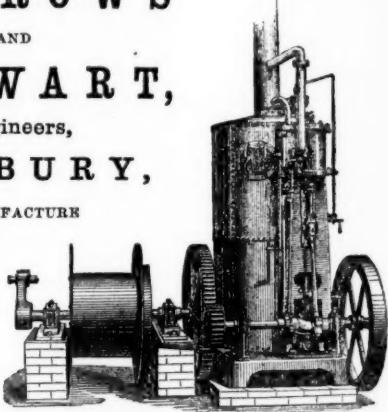
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THE IRON INDUSTRIES OF SOUTH WALES.
ANTHRACITE DISTRICTS.By RICHARD MEADE, Assistant Keeper of Mining Records,
Museum of Practical Geology.

In our previous notice attention was directed to the progress of the pig-iron manufacture in those districts of Glamorganshire in which bituminous coal was employed in the blast-furnace. In this notice it is proposed to trace the manufacture of pig-iron in those districts of Brecknockshire, Carmarthenshire, and Glamorganshire in which anthracite has been, and is now, used in its production, preceding with an account of the ironstone measures of the same districts, and returns of production, together with analyses of the ironstone, and concluding with some statistical details of the production of anthracite, charcoal, and bituminous pig-iron in the United States of America.

IRONSTONE MEASURES.—In the collection of British iron ores, made by the late Mr. Samuel Blackwell, of Dudley, in the year 1851, and in his report subsequently accompanying them, is found an interesting section showing the occurrence of ironstone measures in the anthracite or western district of the South Wales coal field. In this section occurs 17 measures in the neighbourhood of Ystalyfera and Ynisedwyn, of which the following are the more important:—In the uppermost part of the section at Ystalyfera we have a measure of blackband occurring 14 in. in thickness, and yielding an average of 2700 tons per acre. The "Black Pins" measure, next in descending order, consists of two courses, equal to 8 in. in thickness, and yielding about 2400 tons per acre. The "Soap Vein" next interposes; this measure consists of three courses, possessing a thickness varying from 9 to 10 in., and yielding about 2750 tons of ironstone per acre. A coal seam here occurs, known as the "Soft Vein," below which is an ironstone measure consisting of three courses, with scattered balls, yielding about 3600 tons per acre, and known locally as the "Penny Pieces," between which and the "White Pins" measure the Penturin seam of coal occurs. The White Pins, sometimes called the Coedfaula Mine, yields about 4800 tons per acre, and has a thickness of 16 in. occurring in a section of 14 ft. of ground, and consisting of four courses. Next we have the White Vein coal, a seam 18 in. thick, and resting on the "Black Vein Mine"; this last-named measure is made up of two courses, 8 in. in thickness, and yielding per acre about 2400 tons. The "Black Vein Coal," seam 4 ft. thick, separates the "Black Vein Mine" from the "Little Vein Mine," which measure is regarded as the most important ironstone of the district of Ystalyfera, made up of ten courses in a section of ground of 18 ft., and is wrought with the Little Vein Coal upon which it rests, yielding of ironstone 7000 tons per acre. Two other measures here appear—the "Billets" and "Harrils Mine," the last-named resting on the Harrils Coal, and consisting of two courses. Below the Harrils Coal occurs the "Big Vein Mine," a measure of two courses, with a thickness of 6 in., and yielding when worked by level of 1800 tons per acre. The "Big Vein" and "Black Vein" seams of coal next occur; the former 5 ft. 6 in., and the latter 2 ft. thick, and below the "Brass Vein" measure of ironstone, consisting of five courses, in 13 ft. of ground, and yielding an average of 3500 tons per acre, while below we have the "Brass Vein," the "Three Coal Vein," and the "Brynnalenn Vein," the first-named 4 ft. and the others 3 ft. thick respectively.

The known measures named at Ynisedwyn are the "Little Brass Mine," the "Cwm Fil Mine" (a measure of three courses), the "Little Blue Vein," the "Big Blue Vein," the Gnoppog Mine, and the "Pin Mawr Mine," and it has been remarked that all the ironstone measures in this series bear the appearance of having been subjected to an extremely high temperature.

ANALYSES OF THE IRONSTONE.—In the Iron Ores of Great Britain, Part III., the measure known as the White Pins in the district of Ystalyfera, and sometimes called the Coedfaula Mine, is thus referred to—"This measure consists of *balls* and *pins*, or roundish nodules and flat courses; although called white, they are generally of a dark-grey colour, and have frequent cracks filled with carbonate of lime and iron, which in the iron fracture gives a vertical lenticular section." This ironstone measure, examined by Mr. A. Dick in Dr. Percy's laboratory in the Royal School of Mines, is found to be constituted as follows, the ore subjected to analyses being dried at a temperature of 100° C.:—

Results tabulated.

Protode of iron	29.34
Protode of manganese	0.73
Alumina	0.95
Lime	0.84
Magnesia	0.84
Carbonic acid	5.63
Phosphoric acid	24.66
Sulphuric acid	0.14
Bisulphide of iron	0.08
Water	1.00
Organic matter	0.83
Insoluble residue	35.73=99.34
Insoluble residue.	
Silica	24.98
Alumina	0.75
Peroxide of iron	0.53
Magnesia	0.20
Potash	0.30
Iron, total amount	1.00=36.46
	23.22

A trace of lead was detected in 910 grains of ore.

Another argillaceous ore of the Ystalyfera district, known as the "Cheese Mine," is thus described; the sample from which an average was selected for analysis consisted of a nodule of clay-ironstone, dark-grey in colour, and intersected by numerous veins of calcareous iron-spar, in which a few crystals of quartz were discovered:—

Results tabulated.

Protode of iron	42.72
Oxide of manganese	0.46
Lime	4.64
Magnesia	5.73
Carbonic acid	35.70
Phosphoric acid	0.49
Bisulphide of iron	Traces.
Silica as quartz	
Water hygroscopic	0.26
Water in combination	1.54
Organic matter	0.30
Clay, ignited	8.23=100.00

The metallic iron contained in the above ore amounts to 33.45 per cent. From the foregoing and other analyses the average yield of metal from the argillaceous ores of the district may be taken as 33 per cent.

PRODUCTION OF IRON ORE.—The returns of the production of the district in which anthracite is employed are included in those of the South Wales area, it has not been practicable to separate them; in the years 1855 and 1856, when the production of this district was separately distinguished, it amounted to between 150,000 and 160,000 tons. It should, however, be stated that in the ironworks of this district by far the largest part of the ore employed is obtained from foreign sources, principally from Spain.

The following statement shows the yearly production of iron ore in South Wales, as far as returns have been received by the Keeper of Mining Records—

Year.	Iron ore.	Year.	Iron ore.
1855	Tons 752,231	1870	Tons 561,005
1856	630,705	1871	938,714
1857	420,017	1872	1,247,594
1858	368,692	1873	943,926
1859	715,001	1874	661,616

The estimated value of the ore in the year 1872 was £1,247,594; in the year 1873, £43,926, or about 12s. per ton; and in the year 1874, £39,478, or nearly 10s. per ton, a falling off in the value of 1s. 6d. per ton when compared with the value in the previous year.

PRODUCTION OF PIG-IRON.—In previous notices of the iron industries of the South Wales coal area, it was found more convenient to deal separately with the iron-making centres of Monmouthshire and Glamorganshire, rather than considering the production of these districts collectively, they each possessing a history specially their own and dating from a remote period, while the anthracite district is a seat of iron manufacture is of recent date—since 1836, a period of 40 years. In the United States of America anthracite is largely employed in the manufacture of pig-iron, to which by-and-by attention will be directed. The successful application of anthracite (which is practically regarded as a natural coke, and containing upwards of 90 per cent. of solid carbon) as a reducing agent in the

blast furnaces is associated with the names of Mr. J. Palmer Budd, of the Ystalyfera, and Mr. George Crane, of the Ynisedwyn iron-works, and dates about the year 1836; in the following year we learn that the first furnace was erected in the United States of America, at Mauch Chunk, in the Lehigh Valley, State of Pennsylvania, by a Mr. David Thomas, from South Wales, who commenced the manufacture of pig-iron, and where at the present time there are upwards of 40 blast-furnaces erected, while as many as 126 furnaces exist in the United States devoted to the manufacture of pig-iron with anthracite, of which it is recorded 83 were in blast in the year 1873, the production of anthracite pig-iron being 1,249,673 tons.

The anthracite furnaces of South Wales are of comparatively small volume and height, when compared with the furnaces of the Cleveland, Cumberland, Lancashire, and other iron-making districts in which bituminous coal previously coked is employed; this is due to the fact that the use of anthracite in high furnaces is attended with difficulty, owing to its decrepitation, which greatly impedes the smelting operation, this difficulty is only overcome by a dense powerful blast; of late years, however, there is a tendency to increase the height of those furnaces employing anthracite. The average height of the furnaces of the anthracite district may be taken as from 36 to 40 ft., the blast employed varying in pressure from 4 to 6 lbs. to the square inch, while the heated air of the blast ranges from 320° to 550° C. The earliest information showing the production of anthracite pig-iron is for the year 1839, it was then ascertained that out of a total of 26 furnaces 23 were in operation, making of anthracite pig-iron 65,750 tons, or an average of 2860 tons per furnace, while in the same year we learn that 11 new furnaces were in course of construction. The total production of pig-iron in the same year, 1839, in Great Britain amounted to 1,248,781 tons (of which 1600 tons were charcoal pig), the details of which will be found in the following statement:—

Iron districts.	Furnaces: built.	In blast.	Pig-iron made.
Derbyshire	16	14	34,372
Durham and Northumberland	5	5	13,000
Gloucestershire	8	5	18,200
Lancashire (charcoal)	2	2	500
Shropshire	34	29	80,940
Staffordshire, north	10	3	18,200
Staffordshire, south	226	120	346,213
Wales, North	20	13	33,800
Wales, South	101	99	388,100
Wales (anthracite)	26	23	65,780
Yorkshire	29	24	52,416
Scotland	60	54	196,560
Scotland (charcoal)	2	2	800
Total	539	395	1,248,781

In the year 1818 the average production of pig-iron in the furnaces of this district amounted to 4680 tons per furnace. At this period there were nine works in operation employing anthracite, with an aggregate of 31 furnaces built, of which 14 were in blast. The following is a list of works and firms, with the furnaces built and in blast, in the several anthracite districts of South Wales, in the year 1848:—

Name of works.	Owners.	Furnaces: built.	In blast.
Brecknockshire	Ynisedwyn	Ynisedwyn Iron Co.	7
Carmarthenshire	T. Watney and Co.	3	2
Trimsaran	E. H. Thomas	2	0
Bry Amman	L. Llewellyn and Co.	2	2
Glamorganshire	Banwen	Joint Stock Co.	2
	Ollwlyn, or Brin	John Williams	2
	Venall	Aberdare Iron Co.	2
	Ystalyfera	Ystalyfera Iron Co.	11
Total		31	14

The estimated production of anthracite pig-iron about the year 1848 may be taken as between 60,000 and 65,000 tons. In subsequent years since 1855 the production has gradually diminished, as shown by the following abstract, the actual make in the year 1873 being 32,822 tons, and in the year 1874, 23,760 tons. For comparison, side by side, will be found in each of the same years the make of pig-iron in Great Britain:—

ANTHRACITE DISTRICTS.			GREAT BRITAIN.		
Years.	Furnaces.	Pig iron.	Furnaces.	Pig iron.	Pig iron.
1855	34	52,755	Tons	3,218,154	Tons
1857	36	63,440		3,659,447	
1860	35	52,260		3,826,752	
1863	31	22,914		4,510,040	
1866	24	34,516		4,823,897	
1869	23	27,909		5,846,151	
1870	23	28,500		5,963,515	
1871	19	34,781		6,827,179	
1872	13	25,678		6,741,929	
1873	13	32,822		6,866,451	
1874	13	23,760		5,991,408	

As previously stated, the furnaces erected in recent years in the anthracite districts show increased height and capacity; this will best be seen by an analysis of the returns given above for the year 1855, when 19 furnaces yielded 52,755 tons, or 2776 tons per furnace, while in the year 1873 the 8 furnaces then in operation produced 32,822 tons, giving an average yield per furnace of nearly 50 per cent. Referring to the year 1873 it will be desirable to note that the Ystalyfera and Ynisedwyn were the only companies engaged in the manufacture of anthracite pig-iron, the former having 6 and the latter 2 furnaces in blast during the year.

To render this section of the enquiry complete as regards the other iron-producing districts of the great South Wales coal field, in which bituminous coal is employed in the blast-furnaces, the following abstract will show the proportionate production of each district in Glamorganshire, Monmouthshire, and Brecknockshire in each of the same years as those in which the anthracite pig-iron returns are given—from 1855 to 1874:—

ANTHRACITE DISTRICTS.			GLOUCESTERSHIRE.			MONMOUTHSHIRE.			BRECKNOCKSHIRE.		
Years.	Pig iron.	Pig iron.	Tons	Pig iron.	Pig iron.	Tons	Pig iron.	P			

Original Correspondence.

DYNAMITE, AND THE RAILWAY COMPANIES.

SIR.—I see by the Supplement to last week's Journal that the attention of a "Practical Miner" has been directed to my letter of Feb. 5, which he says "contains some curious statements concerning dynamite," but I do not see that he has challenged any of them. I am not at all disposed to enter into a paper war over dynamite, cotton powder, or anything else, but I must say that a "Practical Miner," who I suppose is a manager, foreman, or perhaps an agent, having control over men, is not acquainted with the 14 rules; he ought to for the safety of the men under his charge, but he appears to be better up in that unintelligible volume, the "Report from the Select Committee on Explosive Substances." I think he might well find time to learn the rules mentioned, as I can assure him if he is a consumer of dynamite they will, perhaps, some day prove valuable to him. He appears to make some sort of fun of "some good cause," I would refer him to the Report on Explosive Substances, page 106, answer 114. I have no doubt that it is from the careful perusal of this report that they take their "good cause," as I have no doubt they would quite as willingly carry dynamite as anything else, providing they are satisfied with its safety. FAIR.

THE ROTARY BLOWER.

SIR.—Of the new things lately in the way of mining and metallurgical machinery the rotary blower stands among the more promising. It seems destined to supersede with great advantage the cylinder blower, where the fan fails to do so. In common with all who have had much to do with smelting, I have often felt the need of such a machine as, from notices appearing in the newspapers, this rotary blower seems to be. Would any among the numerous contributors to the Journal favour the metallurgical public by imparting to your columns such particulars as are necessary to form a correct idea of the real practical merits of this machine? Such particulars, for example, as (a), what pressure of blast is maintained; (b), whether the pressure is sufficiently uniform without a reservoir; (c), whether the machinery keeps long in repair; (d), what is the relative cost price of the rotary blower compared with the cylinder blower needed to do the same work, on the one hand, and a fan (say Lloyd's) on the other; (e), what are the relative merits of Baker's as compared with Root's blower?

The advertisement in the Journal of Dec. 4, while it gives a sufficiently full description of the parts and action of the Baker blower, leaves one in ignorance, however, as to the above indispensable data.

Inventors and makers of fans—as, indeed, of machinery generally—are notoriously apt to promise too much. How many advertisements has one not seen, for instance, of fans which the maker promises are capable of replacing in point of pressure many applications of the cylinder, but everybody who has had the trial of fans knows they fall lamentably short, and, indeed, are not applicable at all where the pressure needed exceeds a half-inch of mercury.

These rotary blowers aim at supplying a real want, and the principle of their construction bespeaks great likelihood of their success. Orenburg, Jan. 21.

T. RICKARD.

MINING IN THE EAST—No. I.

SIR.—I observed in the Journal of Jan. 1 that an influential deputation had waited on the Grand Vizier in order to force on his notice the depressed state of mining in the Turkish provinces. They assured him that this was attributable to the restrictive and absurd jumble of regulations which up to the present has done duty as a *Code des Mines*. The most sanguine having long admitted the utter impossibility of mining successfully under the present *régime*, the deputation pressed upon the chief minister of the Sultan the desirability of arranging a code that would give capitalists facilities for procuring mining concessions, and assure them of the security of capital when invested in them. The Vizier is reported to have received them with great urbanity, and to have satisfied the deputation that he fully recognised the paramount importance of developing the mineral wealth lying hid in the European provinces which the effeminate descendants of Mahomet misrule.

The deputation appears to have been dismissed somewhat hurriedly, the Grand Vizier having probably his attention earnestly occupied by some petty palace intrigue, and, this being of greater consequence than any project for the improvement of industry, quietly relegated the subject of an improved mining code as to when another sanguine deputation may wait on him, when the same unsatisfactory amenities will be indulged in. Deputations on any subject connected with reforms in European Turkey may hope for success sometime after the Moslems have crossed the Bosphorus, and finally retired into Asia Minor.

Turkey is, I believe, to a large extent covered with secondary formations. I do not purpose for the present to enter into the question of the mineral riches of Roumelia and Bulgaria, though I may remark that from what I know I am not disposed to think very favourably of the mineral wealth which may exist in the Jurassic and Triassic rocks where disturbed by eruptive action.

I would take this opportunity to warn my countrymen against the folly of investing money in Turkish mines under the present system of administration. It really matters little whether the mines be rich or poor, as little, if any, profits will be permitted by the Pacha or his agents to accrue to the shareholders. It is rarely that a pacha leaves his pachalic other than rich; should he happen to do so he would be met with surprise and scorn by all classes, even by those he forbore to plunder. With regard to the possibility of reforms in Turkey, I may, perhaps, be permitted to refer to a conversation which took place not long ago on board a steamboat between Belgrad and Widin, which conclusively shows how confident the pachas themselves are that no reforms can be made. After a somewhat lengthy conversation as to the necessity for reforms, and the expressed wish of Sultan Mahmud that such reforms should be made, the Pacha of G— ended the interview by quietly remarking "that there was only one way in which the Sultan could hope to commence the reform, and that is by decapitating all the pachas."

The endless delays and expenses which the jumble used as a mining code causes is bitterly aggravated by the irritating carelessness and corrupt manner in which they are administered by the petty officers of the Government, who, being men but slightly educated and intensely bigoted, render the life of the resentful British miner a continual torment. Day by day comes some demand on the time or purse of the unfortunate resident agent, and, whether legal or otherwise—seldom legal, but very often otherwise—must be attended to. Bribery is resorted to with but small success, as impediments are placed in the way that require continual liquidation. I have often known petty—very petty—magistrates order the officers paid by a company to do something that would occupy the greatest part of a day to execute, and become excessively indignant when the resident agent has not permitted his officers to be so dictated to.

Unfortunately, before these local difficulties have been learnt much time and capital have been expended in obtaining the concession and preliminary charges, and so the company perseveres, hoping that matters may improve.

Those Turkish provinces really independent, but nominally under the suzerainty of the Sultan, present features more favourable to the speculator, the French mining code having been taken as the foundation. The Slaves, however, have by no means forgotten the manners of their former masters, and have well copied many of their vices. Although the laws do not permit bribery, one soon discovers that, like the wooden ungreased wheels of the Central American carreta, the friction is enormous, and results in just as much row. The emancipated Slaves object to any kind of manual labour, considering it derogatory to their newly-acquired semi-freedom, and when not possessed of sufficient means to start a little business prefer lying in idleness and dirt to performing any work.

There are fields of mining in the East in which capital judiciously invested would result in very fair profits; these I shall take a future opportunity of describing.

I propose in my next letter to give a general sketch of the geology of Servia and its mineral deposits. These deposits have been in the

past very valuable, and were extensively worked both by the Romans and Venetians, as the remains of Roman baths and coins found in the debris abundantly attest. These deposits are really interesting from their peculiarity, and well merit the attention of the mining student.—Feb. 11.

EMPRESSARIO.

SWEDISH IRON ORE.

SIR.—I note the remarks of the "Writer of the Article," in last week's Journal. While Mr. David Forbes was the consulting engineer of the Central Swedish Iron Company (they called him Professor Forbes) they appear to have entertained the idea of sending ore to England. At the first general meeting of the company in London, on June 4, 1872, Major-General Sir Collingwood Dickson, K.C.B., in the chair, the report stated—"It is considered desirable to open out the mines held by the company, and, should the present high prices of ore continue, to ship ores to England if on trial it should be found profitable;" and the Chairman said—"A trial shipment of about 1000 tons has been ordered, 200 tons of which are now coming forward," and I see in the balance-sheet for the period ending March 12, 1873, the ominous entry—"Loss on shipment of ore (trial cargo), 731. 10s."

I advise "Fair Play" to read the prospectus, dated London, Feb. 28, 1872, (Mr. Forbes's report is dated Nov. 27, 1871), with the reports and speeches of the Chairman, Mr. Forbes, and others, as reported in the papers at the time.

AN ENGINER.

RICHMOND MINING COMPANY.

SIR.—The directors of this company have always shown a great amount of virtuous indignation whenever it has been said that they have paid dividends out of borrowed money, and they have defended their policy by alleging that they have merely obtained advances upon the bullion produced; but now that they come forward to borrow 50,000l. on debenture—not for working capital, but to repay in part, and in part only, the advances they have obtained from their bullion agent, and distributed to the shareholders in the shape of dividends—it appears to me they stand self-condemned, and that they must choose one of the horns of the dilemma upon which they have placed themselves—that of having paid dividends either out of borrowed money or out of capital. What would the Court of Chancery say to such financial manipulations?

OBSERVER.

Feb. 23.

RICHMOND CONSOLIDATED MINING COMPANY.

SIR.—Months have passed since I put through your columns a series of questions concerning this unfortunate company. The then promised dividends have not been declared, the weekly returns have fallen off, the company (as was to be expected) has drifted into debt, and the shareholders are being appealed to for subscriptions towards debentures amounting to 50,000l. My queries were put in reply to a communication appearing in the previous week's Journal, signed "One Behind the Scenes." The writer of that letter was clearly demonstrated by the matter communicated, but one of its most barefaced portions was the positive statement (the letter was published in the Journal of Oct. 30, 1875), "that a dividend would be declared next month," and that a well-known lead smelter, who has erected the new Rozan pans at his works on the Tyne (the same as those now at work at the Richmond Mine), has purchased 600 Richmond shares." "One Behind the Scenes" at the same time also told us (October, 1875) that "the dividend next month will be on the six months' working, ending August 31, 1875, the gross profits will be 210,000l." One would imagine this statement strong enough, but it pales away when "One Behind the Scenes" told us with unblushing effrontery "that the balance-sheet now in the hands of the accountants will work out so as to allow a dividend of 10s. per share, or 10 per cent. on the half-year." When this statement was made, "One Behind the Scenes" knew the company was heavily in debt to the bullion agent. We were further told that "Mr. Probert had been at San Francisco, but was then at Eureka," and, added "One Behind the Scenes," "I have no doubt but that before he has been long there the Rozan pans will do their work well, and our week's yield will rise from an average of \$42,000 to \$52,000, which means a 50 per cent. dividend."

The re-publication of "unanswered questions" seems fashionable just now, therefore with your sanction I will follow the fashion, and re-ask those I put in November, 1875. As I then wrote, your correspondent, "One Behind the Scenes," having an intimate knowledge of the company's affairs, may give some information upon the following points:—

1.—Who paid the "Rev." Mr. Probert's expenses to the Continent to find out the best process for the treatment of the Richmond ore? If paid by the Richmond Company, who is to benefit by an arrangement that may be made for the use of the patent in America, the right having been acquired by Mr. Probert?

2.—Why were 1000 to 1300 tons of bullion allowed to accumulate on the dumps, in order to make a good show for the patented process?

3.—Why, as the managing director of the Richmond Company, being in San Francisco during the whole of the financial crisis, knowing well from daily communication with the company's bankers, did not Mr. Probert keep his London colleagues advised of the impossibility of paying the dividend?

4.—Is it true that the Richmond directors have not had any official communication from Mr. Probert since some time before August?

5.—Is it true that this Rozan patent has already cost the Richmond Company 18,000l., or 6000l. in excess of Mr. Probert's estimate?

6.—If Mr. Reuben Rickard (the present manager of the Richmond Mine) was selected by Mr. Probert "as the best qualified man to work the Rozan pans," how is it that, so far, the process has proved a disastrous failure, the company being again compelled to ship bullion, so as to reduce the heavy indebtedness to the agent?

7.—If the "best qualified man" has signally failed to make the patent work, what is the prospect that Mr. Probert may be able to do so upon his return from San Francisco?

8.—Upon what authority does "One Behind the Scenes" make the statement that "a dividend of 10s. per share will be declared next month?" If he really be "behind the scenes," most assuredly his clerical friend on the other side will admonish him severely for having made such a positive misstatement. Can the next dividend be declared before March next?

I must now alter the last query, and say it is doubtful whether any more dividends can be declared unless other discoveries are made.

ONE WHO KNOWS, BUT NOT "BEHIND THE SCENES."

Feb. 23.

SEPARATION OF MINERALS.

SIR.—Will you be so kind as to allow me once again to make a few remarks in your valuable Journal in reply to Mr. Joseph Jewell? It is almost a pity that I should have hit him so hard that he threw himself into a "white heat" of passion, and using very "ungentlemanly" terms (to say the least of them), without disproving in his letter anything that I said. The reason of my delay in not answering him sooner was that I have other business to attend to besides writing letters. In the first place, I would remind him that I did not introduce the subject for discussion, but to defend Devonshire and Cornishmen from the onslaught made upon them by "Adventurer," who said that they could not separate lead from blende, &c. I told him, of course, that they had worse than that to do, and mentioned several mines where there was a combination of minerals.

Then, as to there not being any minerals of my dressing sold from Burrow and Butson, I would tell him that samples were taken and assayed, and a good marketable value reported of them, and I never knew what they were sold, as I was given to understand they would be, according to the assays; but if they were kept for several months, and mixed with a lot of other stuff, as Mr. Jewell says, of course I cannot help that. And, as I have before stated, what I dressed so satisfied the managing director that he came for me some months after I left to return to the mine, and I have several letters in my possession in which he offered me double the amount of wages I before had received; and that fact says more in my favour than all Mr. Joseph Jewell can say against me. Mr. Joseph Jewell says he is not only a "theoretical book-taught" man, but has had many years "practical experience in many parts of the globe." Now, let me ask, Mr. Editor, what sort of a practical experience can he have

had in lead, for if am correctly informed it is only about five years ago he left a western mine to go abroad? He says himself he has visited many parts of the globe, and practised on minerals "too numerous to mention." And by the way, he boasts of his "merit," perhaps he will give your readers a satisfactory reason why (if reports are correct) the above mine, while he was agent, was making "calls," but in a very short time after other parties took it in hand it became a dividend concern, and no alteration in the ledgers. He being but a young man comparatively, and he himself acknowledges a great portion of his time has been spent over the writing desk, his wanderings over so "many" parts of the globe in such a short time reminds one of Noah's dove, that could "find no rest for the sole of her foot."

In Mr. Joseph Jewell's first letter, it will be remembered, he said "doubted if I could find one boy that could do it." Now he admits, there are very many employed about the same thing, but adds I "could not find one that could separate these minerals without instruction." No person said they could hence the reason why we prefer them young, for the express purpose of learning them. Such is a remark as that just shows what sort of a man Mr. Joseph Jewell is, with all the instruction he has received from his scientific tutors. I hope your readers, Mr. Editor, will not misunderstand me here, as I certainly do not deprecate education, for it is a fine thing when made a proper use of, but when we see men of Mr. Jewell's stamp, vain of their great literary attainments, boasting of their extraordinary "amount of brain," and saying because they cannot do a certain thing it is not possible to be done (as he said in his first letter), I will leave the public to judge who the "conceited" party is. And our adventurers are getting to see that the men who write long flashy reports—great scholarly productions, written in such an elaborate manner that it takes a common man with an ordinary education some time, with a dictionary at his elbow, to understand what it means, are not the men, as a rule, who do the most work and bring them (the adventurers) the greatest interest for their money. Mr. Joseph Jewell intimates that in the present depressed state of things in the mining world the dressers are receiving too high wages; or, in other words, that mine managers are spending their employers' money needlessly. I will leave that to be answered by our Cornish and Devonshire really good, practical, thorough-going mine captains, of which the two counties can boast a large number, men of whom employers and employed have need to be proud; men, I maintain, who if they left their own country would be found wanting, and of whom we should not say that they "left their country for their country's good."

I should like to remind your readers, Mr. Editor, especially those who do not, perhaps, quite understand the meaning of the word "halver," that it is a person who can get a good living, and put money in the pockets of the adventurers, from a heap of stuff that some persons would throw away. I am exceedingly obliged to Mr. Jewell for his kindness in offering to "make a better man" of me, and to "set me on my legs;" but, at the same time, I would say to him that I am there already, and so for the present decline his kind offer with "thanks." Certainly, it does not so much matter where a man is born, but I do contend that it does make all the difference where and what he spends the first 25 years of his life about. But, then, he says he "was born near the richest lead mine in Cornwall," but his western neighbours know that here his memory failed him, for West Chelton is 11 or 12 miles from Redruth. It is evident that in a short time Mr. Jewell will have ample opportunity of displaying his skill in dressing, for, according to his own reports for some time past, his ends and stopes have been highly valued, but we earnestly hope he will not sell all his ores at one time, for he might possibly satiate the market, lower the prices, and thereby injure other companies.

Shall I be encroaching too much on your valuable space, Mr. Editor, to say a word or two in reply to your other correspondent "Medio?" I would remind him that Mr. Jewell made the first "personal" attack, for I did not make use of any person's name in my first letter, but if the "cap" fitted him who is to blame? I would say to him that the minerals at Cargoll were thoroughly associated, and as in most mines a certain portion, of course, was picked, but by far the largest quantity was dressed. I should like for "Medio" to tell me whether or not he considers Mr. Joseph Jewell as coming out in the character of a "kind shepherd" in his first attack on me? Certainly I do respect "lettered gentlemen," and consider them my "superiors" when they act and speak like gentlemen in the true sense of the word.

ST. TEATH, Feb. 17.

MINING EDUCATION.

SIR.—Despite the enormous amount of capital invested by all classes in the search for minerals in this country, we possess no comprehensive treatise on mining—a *vade mecum* for miners. Were a student to enquire of a publisher for such a work that publisher must fain confess that he knows of no such book published in England, and that of those published in America he could not consistently recommend one. The want of some work on the concentration of minerals has also been much felt, the only notice I know of on this branch of mining being contained in Dr. Ure's Dictionary, edited by Mr. Robert Hunt, F.R.S. On metallurgy we have numbers of publications, and the mining engineer has usually little difficulty in obtaining information of the means for reducing his ore. It is, however, but seldom that managers of English mines have to smell their own ores, the general practice being to sell all ores on the "floors," according to samples taken by the different mining companies. Latterly another branch of mining has attracted much attention, one which will demand careful study and great thought on the part of mining engineers. I allude to the chemical reduction of ores by what are generally known as wet processes, which are destined in the future to play no insignificant role. These processes are more particularly adapted to mixed ores of low percentage, of which immense quantities remain laid open in the abandoned mines of Cornwall; these ores are destined at no very remote date to be mined and reduced, and will give employment to hundreds in districts now made desolate by ruined mine buildings and decomposing attle.

The fact of there being no sufficient treatise on the subject of mineral deposits, and on the treatment of the ores therein contained, is a cause sometimes of grave inconvenience even to the experienced mine manager, and undoubtedly greatly retards the progress of the young miner, compelling him to rely principally on his actual experience gained in the localities where he has been employed. This tends to foster narrow and bigoted views, much to be deplored, and leading often to disastrous results. The young miner reasoning from the mineral formations, amongst which he has obtained his knowledge to other deposits geologically far removed, is peculiarly liable to glide into error, and be led to recommend the expenditure of capital in a wrong direction. The same remarks apply with perhaps stronger force to the means adopted for the concentration of minerals. As a young engineer, I felt seriously the want of works on mining, which I endeavoured to supply by visiting various mining centres. Certainly during the past 20 years many publications have appeared which give valuable information of those sciences a knowledge of which is necessary to the manager of mines, still I consider that the most crying want of miners remains unsatisfied—i.e., a comprehensive work on mining containing geology as affecting mining, enough of paleontology to distinguish the best known fossils, so as to determine the age of strata, occurrence of veins, and mineral deposits of every description, machinery used in mining, concentration of minerals, &c., which should be added methods of reducing ores by wet processes.

Many books on mining and metallurgy have been published in America, but none supply the want felt. Most of them are evidently compilations from older authors brought up to the new modes used in America, while of those pretending to show *raison d'être* of mineral deposits most are meagre in detail, and fail to increase our knowledge, others being extremely wild, think cosmogony a part of mining, and treat us with an elaborate account of the formation of minerals during the time they suppose to exist between a diffused chaotic fire-mist, and the first consolidation of strata on the earth. Few will be disposed to question that the want of sufficient data

respecting the varied and complicated phenomena displayed in mineral formations gives little encouragement to anyone to attempt the publication of a standard work on such a difficult and important subject. It is almost impossible that one man should, without assistance, be able to master and arrange the innumerable phenomena involved in the formation of ore deposits. Mining engineers, as a rule, though deeply interested in the elucidation of the conditions of deposits, have really little time to indulge in the relaxation, being immersed in the designing and construction of works demanding the greatest care and attention, the anxieties of which leave them often unfit for study, and the more experienced the engineer the more his services are required by the public.

We have, however, in the Royal School of Mines, Jermyn-street, a centre of mining knowledge which is expected sooner or later to produce a standard work on the sciences in connection with mining. and I cannot but believe that such work is in preparation. The mining world recognises in Prof. Warington Smyth one who has had great opportunities of studying the geology of mining, and one who has not failed to benefit by them. Many have devoted their abilities and leisure to discover some general laws regulating the formation of veins and deposits, notably the late Mr. W. J. Henwood, F.G.S., of Penzance, whose indefatigable exertions amongst the mines of Cornwall are above praise; also the late Evan Hopkins, whose ingenious theory of the magnetic formation of veins is well known to all students of geology and mining. The Germans have been unremitting in their efforts in the same direction, and have more or less successfully elucidated the laws regulating the deposits of ores in the Hartz, Erzgebirge, &c. It is to be regretted that some of these have not appeared in the English language, as they contain much valuable information.

But it is not to a few men that should be left the Herculean task of elucidating the intricate, varied, and obscure conditions which induce the deposition of ores, either in veins or deposits. Every miner, whatever his position, may labour with credit in this field, which is co-extensive with the world. Do we not know and continually hear of that valuable class of miners called tributaries, who are so expert in finding bunches of ore, and do not mine captains confess to themselves how much they owe these tributaries, who sometimes keep a poor "bal" going for years. These men possess valuable information respecting veins and throws. The underground captain, is *par excellence*, the man who could contribute much of value concerning the mine which he daily traverses and examines. He belongs, unfortunately, to a class eminently opposed by inclination and principle to putting ideas to paper. He has gained his experience by life-long labour, and believes that knowledge gained any other way is not of much value. The time has, however, arrived when to withhold the result of experience obstinately argues want of intelligence; let every agent or miner who possesses local acquaintance with ore formations, whether in veins, carbonas, or deposits, beset himself, and give his experience freely to the world for the benefit of posterity, and that experience, if freely and intelligently offered, will prove no small contribution to our present knowledge of vein formations, and continually accumulating will eventually lead to the elucidation of much which at present is enveloped in obscurity.

The world is full of curious and deeply interesting vein-formations and deposits of mantic, descriptions of which would be ardently read by those whose mining occupations necessitate a continuous residence in England. The copper and silver deposits of Chili, amongst the almost inaccessible snow-capped peaks of the Cordilleras; the silver hills of Peru, in whose mines the poor Indian subjects of the once wealthy Incas fell a sacrifice to the grinding cupidity of the Spanish invaders; the immensely rich veins of silver ores on the Mexican plateau; the quartz reefs and bonanzas of Nevada; the deposits around the rim of the Utah basin, the discovery of which destroyed the cherished autonomy of the Mormons; the native copper pockets of Lake Superior, supposed to be exhausted; the tin islands of the Malacca, of which little is generally known; the interesting but unknown mining countries of the Himalaya; the extraordinary discoveries of tin in Australia and Tasmania, the production from which threatens to crush tin mining in Cornwall; these, with numbers of others, all merit description, and, mixed with anecdotes of mining manners and customs, could not fail to highly interest the readers of the *Mining Journal*.

In writing this letter I must confess to a modicum of selfishness and a wish to benefit by the experiences of others in mining fields unvisited by myself. Naturally everyone interested in mining, which possesses a fascination to the initiated never to be lost, is anxious to obtain all the information possible of mineral formations. At the same time I do not desire to benefit by the experience of others without contributing my mite to the same treasury of mining lore. Should the idea of such contributions, Mr. Editor, coincide with your wishes and suit the taste of your readers, I would agree to send occasionally some paper illustrative of any mines which may possess interest.—Feb. 21.

IMPRESSARIO.

GOLD IN WALES—No. XIX.
DOLGELLEY DISTRICT—DOLFRWYN OG SECTION (continued).

DOLFRWYN OG MINE (continued).

Capt. JOHN DAVIES wrote (March 15, 1852):—"I devoted two days to the inspection of this mine, and am fully satisfied that the geological formation is indicative of large deposits of metalliferous minerals, not only for copper and the base metals, but also for gold, &c. The micas, or primary formation, consists of compact porphyry, but the prevailing rock is beautifully decomposed gneiss, a stratum of which is highly mineralised; branches or veins of copper are almost everywhere to be seen cropping out at surface, and, therefore, the water course out has been so saturated with a solution of copper from time immemorial that upwards of 90000 tons of copper has been obtained from the bog turf after calcination, and from the same source; the strata are full of incrustations of malachite and green carbonates of copper. In this set are several lodes running in different directions, one of which is from 12 to 18 ft. wide, composed of beautiful gossan, sulphur, copper, and quartz. This lode runs nearly east and west, has an underlie of about 2 ft. in a feather, and is known as the great mantic lode. There have been some partial explorations on this lode from shallow drifts in the side of the mountain, from which small parcels of ore have been obtained—14, 32, and 44 tons; but it is evident from the nature of this champion lode that deep mining must be resorted to in order to develop its resources; and if the shaft (now in course of sinking) be sunk to the depth of 50 or 60 fms. I have no doubt but that large quantities of copper will be found. I inspected the various levels driven into the mountain, and cannot avoid remarking that hitherto no legitimate mining has been carried into effect, for so-called disappointments in not finding the object desired. The large auriferous gold quartz lode attracted my special attention; from wall to wall it is from 7 to 8 ft. wide, intersected, and the distances of the heaves proved: also bring up an adm from the new shaft, open a good wheel-pit from surface to the proposed adit, erect a wheel of 50 ft. diameter, and sink 50 or 60 fms. with as little delay as possible to intersect the great mantic lode, and for the auriferous quartz lode erect a good stamping mill (unless a better mode can be suggested), finely pulverise the quartz, and let it pass over one of my self acting rotative tin-dressing machines, liquify the residue with acids, and the proprietors cannot fail of getting large fortunes out of Dolfrwynog Mine."

MEMORANDUM (1853).—Gold in quartz has been found at Old Dolfrwynog far richer than any I have yet seen at Clogau. One stone of 16 ozs. yielded 9 ozs. of gold. I have extracted gold from the quartz at the rate of 400 ozs. to the ton, and found quartz and barytes containing auriferous galena of extraordinary richness. Prof. RAMSAY, in a communication to the Geological Society of London (1851), wrote:—"When I inspected the geology of this district in the spring of 1853, the most remarkable and promising lode was the new gold lode at Dolfrwynog. The lode runs about west north west and east south east, in the low ground south of Moel Hafod Owen, on the east watershed. It is principally composed of white saccoidal quartz, irregularly traversed by numerous small, loose joints. Chlorite, decomposing talcose matter, and pink carbonate of lime are intermingled with it. In parts the quartz assumes a semi-granulated aspect, profusely intermingled with the substances of the lode is largely charged with iron pyrites. As a rule, in the original working of the lode and in subsequent operations, it was first opened in search of copper, and a shaft was sunk to a depth of about 20 fathoms. During the process, however, it soon proved to contain more attractive metal. On examining a heap of quartz which lay at the mouth of the shaft, and turning over a few pieces, I readily saw with the naked eye gold in small flakes and grains, irregularly disseminated throughout the quartz. In a more select heap of quartz on all the pieces it was distinctly visible to the unassisted eye; and one mass in particular, heavier than a strong man could lift, was literally spangled all across its surface with rich glittering gold. Gold has also been detected by Mr. Byers in the matrix of the copper-bearing lode about a mile further south, and in the West Dolfrwynog lode, by the spot marked "Turf Copper Mine" on the map. All of

these occur in the same talcose rock. It was the peculiar character of the rocks that induced me in 1851 to recommend my friend Mr. Attwood, before he started for California, to go down and examine this ground for gold. He promised doing so, but engagements, consequent on his speedy departure, prevented its accomplishment. A portion of this rock, taken from the wall of the Dolfrwynog lode, has been analysed in Dr. Percy's laboratory by Mr. Richard Smyth; it yielded no gold. On the banks of Afon Wen, about a mile above the bridge, are some ruins of buildings, and below them, close to the river, the remains of charcoal ashes and bits of bone, mostly covered with herbage. This place has a very singular and, in conjunction with the late discoveries, a very significant name, which it has maintained from time immemorial, expressive of gold having been melted or worked there. This name 'Merdyn Coch's aur,' signifies the ruins of red gold. The tradition is that the Romans formerly worked gold there.—(Mr. Byers, of Dolgellau, MS.) Whether all the reports in circulation of the occurrence of gold are actually true or not, it is at all events a fact, that at Dolfrwynog it has been found in an unusual quantity; also that its existence is certain at various other places. If in the lodes a considerable amount be scattered through the country, then we should expect that gold would be detected by washing the marine drift that rises in the mountains of North Wales to a height of over 2000 ft. In this drift it might in places be somewhat concentrated, partly by an ancient natural process of seashore washing, partly by the more modern action of rivers, as in the case of the stream tin of Cornwall and of the gold in the superficial deposits of the Ural, of Australia, of California, and in those of Canada, some years ago discovered by Mr. Logan. Gold, in appreciable quantities, was indeed found by washing in the bed of the Mawdiddach, in the summer of 1852, by the Hon. F. Walpole and Sir Augustus Webster. I think it probable that in this river attempts might be most successful immediately below the confluence of the Mawdiddach with Afon Wen, and in places in the bed of the Wen, and on the east and south watershed of the range of hills that runs from Tyn-y-Benbros northwards towards Moel Hafod Owen. In favourable spots it might be well worth the pains to wash the detritus on the Mawdiddach between Dolgellau and Y-Gelli-gamlyn and in the bed of the Wen, from thence to Dolfrwynog. This opinion is founded on the fact that the talcose rocks which the Dolfrwynog lode traverses lie on the east watershed of the above-mentioned range, and if gold be in them elsewhere in any parallel quantity between Moel Hafod Owen and the lower part of the Llanfaethreth Valley, then it might be expected in the detritus in the bed of the stream between Dolau and Y Gelli-gamlyn, nearly opposite to which streams that traverse the talcose rocks empty themselves into the Mawdiddach."

In a preceding paragraph of the same paper Prof. RAMSAY says—"Dolfrwynog is on the west of Afon Wen." It lies in the heart of the talcose schist, which almost everywhere contains much iron pyrites in small crystals, scattered through the body of the rock, together with specks of the yellow sulphur of copper. Small veins of this ore are also scattered through the mass. It was in part of this area, about 1/2 mile south and south-west of Moel Hafod Owen, that the famous Turf Copper Mine was situated. A peat bog occupied the greater part of the bottom of the valley. The turf was pared off the surface and burned in kilns, and being partly saturated with copper, a large residue of valuable ore was left in the ashes; many thousand pounds worth was thus extracted. The hills have since been burrowed in all directions in search of the great lode, or bunch, from whence the water was supposed by many sanguine adventurers to have been carried in solution to the peat; it has never yet been found, and perhaps does not exist, the water that percolated through the rocks and rose in the springs having more probably carried the copper in the form of a sulphate from those minute quantities that are more or less diffused through the mass of the hill immediately above the Turf Mine."

MEMORANDUM.—At the Berdan Reduction Works (Feb. 16, 1855) Messrs. Johnson and Matthey appear to have operated on 21/2 tons of gossan—"results not communicated, but a large amalgam obtained." (Dolfrwynog.)

As per the *Mining Journal*, Mr. JOSIAH HARRIS wrote (May 8, 1855):—"If notoriety is obtained by publishing extraordinary statements, without their having the least pretensions to truth, I think Mr. Calvert bids fair to stand in that unenviable position. That gentleman's assertion, inserted in your last week's Journal, has caused no little sensation in the capital of the Welsh gold regions (Dolgellau) and elsewhere. 'That eight parts out of every nine of gold are wasted at the Dolfrwynog Mine, &c. In calling upon Mr. Calvert to substantiate this assertion, I do so not only upon public but also upon private grounds, having recently reported upon the Dolfrwynog Mine, and that in direct contradiction to Mr. Calvert's statement. I trust Mr. Calvert will see the necessity of giving your readers, without loss of time, some account of his assertion (if he really has any), and also the names of the others who are committing such wilful waste by the anybody's process."

As per the *Mining Journal*, Mr. JOHN CALVERT replied to Mr. Josiah Harris (May 16, 1855):—"As Mr. Harris is in no way connected with the Dolfrwynog Mine, I decline to give him any information, and more especially as I cannot find time to open a correspondence with everybody who chooses to attack my professional statements a few months after they have changed their calling. During the last year and a half I have made 17/4 assays for gold alone, a large number of which contained so small a result that they very much disappointed the senders, and many companies have remained unfigured in consequence; to all these assays I signed my name. Mr. Harris may make experiments and sign his name to whatever he fancies; but I do not see that it will alter one jot the value of my careful and cautious results."

Capt. GEORGE WILLIAMS wrote (Jan. 31, 1856):—"According to your instructions, and having been permitted and accompanied by Capt. Davies, I have this day inspected the underground workings of the Dolfrwynog Gold Mine. I have also made a rough sketch of the workings done, which may enable you to understand in which the works now stand, and also the bearing of the main lode and the south branch, mostly worked upon in the 21st, which is at present abandoned, but still at work on the same branch in No. 9, where the lode is small and poor. In No. 7 a cross-cut has been made north, about 6 fms. from Peter's shaft, where the lode is intersected; when first cut it seemed good and productive, but after driving a few fathoms the lode became small and poor, but in the forepart to day the lode is more kindly, about 2½ ft. in width, with good bands of quartz; on driving this east I expect a junction will be made with Price's shaft. You will see by the sketch that the lode has not been proved from Peter's shaft to Price's shaft in depth, except in the shallow workings above. It appears that there is no new discovery made since my time; there is only one shoot or branch of gold bearing ground, and Peter's shaft, or which was called the Gold shaft, is sunk in the middle of it. The shoot or branch averages in length from 9 to 10 fms., dipping a little east. You will see by the sketch that there is not much ground left standing on either side of the shaft—that is, the ore-bearing ground—but I am glad to report that the lode will be productive in the bottom of the workings, underlying from 4 to 5 ft. per fathom. I should judge by the present appearance that the bunch of ore will be very soon out of your boundary; this I could not ascertain without being permitted to dial and measure. The lode in the west end is more perpendicular, from 4 to 5 ft. in width, with bunches of quartz here and there along the driving, and difficult to ascertain the quantity of quartz per fathom of ground. I should recommend a cross-cut to be driven north a little to the east of Holroyd's shaft, which might prove satisfactory. I should also abandon the workings on the south branch in No. 9 east until communication is made with Price's shaft in the driving that they now have in the 20th. You will see on the sketch that there are 48 fms. driven on the south branch in the 20th, and proved, so far, unproductive and poor. If my memory is right (at the time when I superintended the mine the driving was called the Fownyng level) about half-way between Peter's and Price's shaft we drove through some very kind ore-bearing ground. On this spot the first piece of visible gold was found, and I was always of opinion, and do still continue the same, that this will hold well no. This part of the lode has not been touched in the lower workings, but this will be soon proved by continuing to drive on the lode at No. 7, towards Price's shaft. So before I could venture to report in favour or even to condemn the mine I shall await to see the results of this driving. But taking into consideration the present appearance, and not looking on for better prospects, from 35 to 40 tons of quartz would be about the average that can be brought to grass weekly. But by taking the lode indiscriminately makes another view, and remains to be proved, if not proved, whether the whole of the lode will pay for its working. If either of the patentees should be successful in finding out a more proper way in extracting gold than by amalgamating, it will be of great importance and benefit to the Dolfrwynog Company and many others. By looking at the heap on the surface, which is ready for crushing (this I put down at 1500 tons, more or less) my estimation is that the cost of bringing it to grass exceeds 3s. per ton. The machinery was out of repair to day. Strong cog-wheels are going to be attached, and, as my report is private, my candid opinion is that our pair of crushers and two pans would have done all the work at present, cause much less friction in the machinery, and save the constant breakage by sending the stuff required first into the crushers then into the pans. The quantity of ore that can be crushed daily after fitting up the engine and going regularly to work remains to be proved. No specimens were permitted to be taken from the mine without the sanction of the committee."

Capt. DAVIES reported (Feb. 8, 1856):—"That the two mills had crushed 26 tons in 21 hours. He sent up two boxes—one of the tailings from the quartz, which produced by Mr. Mitchell's assays at the rate of 6 dwt. 12 grs. per ton. The other box contained crushed quartz caught before it had reached the amalgamators, which gave at the rate of 9 dwt. 9 grs. to the ton." Capt. DAVIES wrote (March 5, 1856):—"In experimenting on the sulphur contained in the stuff, we find that by calcination visible gold is to be found, and, therefore, we have laid blankets for the purpose of saving all the iron pyrites and other metalliferous compounds. From the experiments made we expect almost as much gold from the poor pyrites as from the quartz. As a check, we send you to day a box of the stuff, and shall feel obliged if the board will direct the same to be carefully assayed."

MEMORANDUM.—The box of stuff alluded to was sent to Mr. John Mitchell for assay, and he reported it to contain at the rate of 13 dwt. 1 gr. of fine gold to the weight of about 500. (Wm. Battye, secretary.)

MEMORANDUM (1856).—Experiments with barrel amalgamators.—No. 1. 2½ cwt. of manganous sand on blankets, after having passed through amalgamators, calcined and amalgamated 24 hours. The mercury squeezed through the leather gave 10 ozs. of amalgam, which being burnt off produced red oxide of copper. No appliances for separating the gold from this.—No. 2. 2½ cwt. of manganous sand calcined, washed, and amalgamated for 36 hours; mercury retorted, and results nil.—No. 3. 2½ cwt. of the elvan, calcined, washed, and amalgamated 36 hours. Mercury retorted gave red oxide of copper. No appliances for melting.—No. 4. 2½ cwt. of sulphur lode, richer on blankets (calcined), amalgamated 36 hours, and results nil.—No. 5. 2½ cwt. of manganous sand on blankets, after having passed through amalgamators (not calcined), amalgamated 36 hours. Mercury retorted produced 1 dwt. 5½ grs. of fine gold. Rate of 9 dwt. 20 grs. to the ton.—No. 6. 2½ cwt. of uncalcined manganous sand on blankets, after having passed through amalgamators (not calcined), amalgamated 48 hours. Mercury retorted. Produced 10 grs. of fine gold. Rate per ton, 1 dwt. 16 grs. A portion of the gold lost in smelting.—No. 8. 2½ cwt. of sulphur lode, saved on blankets (not calcined) amalgamated for 48 hours. Mercury retorted. Produce 5½ grs. fine gold. Rate per ton, 1 dwt. 20 grs.

MEMORANDUM by the late Mr. James Harvey (May 20, 1856).—On March 19 Capt. Davies reports that he has resumed retorting the mercury in the presence of two of the directors. The miserable results must be reported as a failure as far as Davies's amalgamators are concerned. Capt. Davies suspected foul play since the 420 tons produced only 18 ozs. of gold. Of that quantity they estimated 10 ozs. as having been produced from one seventh part of the mercury. The Dolfrwynog Company reported (May 20, 1856).—"That the first 100 tons of quartz produced 34 ozs. 12 dwt. 11 grs., and that another trial of 22 tons produced 13 ozs. 4 dwt. 11 grs. of gold. Directors then—Messrs. Cheston, Haydon, Holroyd, Church, Price, Smallpiece, and Peters."

* This stream is un-named, but not named, in the Ordnance Map. It washes the east base of Moel Hafod Owen and passes through a deep valley into the Mawdiddach, into which it flows, nearly opposite the fourth mile-stone on the Dolgellau road.

Capt. GEORGE WILLIAMS wrote (May, 1862).—"Through this sett four distinct lodges traverse, and which have been opened upon, two bearing north and south, the great copper lode being east and west, as marked on plan, the gold lode being N. W. S.E. From the shallow workings made on the copper lode scores of tons of yellow copper ore were raised, and from the flat below hundreds of tons of peat were burnt for copper, which ashes were sold from 17s. to 18s. per ton; and in the year 1853, before the discovery of gold was made on this sett, a shaft was sunk to the depth of about 12 fathoms, which was intended to intersect the copper lode at a depth of 30 fathoms, but was then abandoned. I consider this much in favour of the present company, or whoever may have the courage to carry this shaft down to the lode; it is my candid opinion they will be highly remunerated.—Gold Lode: The bearing of this lode being S.E., N.W., underlying N.E. about 4 ft. to a fathom, averaging in width from 1 to 6 feet, composed of flocks, quartz, schist, copper, lead, blonde, mundic, and gold. A level has been driven to intersect this lode, which is called the Fownyng level, and also a driving along the lode in the said level, after intersecting the lode for about 30 fms. Three shafts have also been sunk on this lode to the depth of about 30 fathoms (as far as my recollection goes), but only one productive for gold, which is called the Gold shaft. A communication has been made between this and the N.W. shaft. The lode, except a few fathoms between the Gold shaft and the S.E. shaft, is still standing ground, unworked, owing to the former company misdriving in trying to form a junction or communication between these two shafts. In starting from the junction of the lodges at Gold shaft they followed the south branch, and left the main lode. I consider this a very rich piece of ground for gold, as I am aware of a shoot of gold in this which I drove through in driving the top adit, and was never touched afterwards. To speak of the richness of the mine is useless, as gold did exist, and does exist, in Dolfrwynog in varying quantities. It was not the quantity nor the quality of gold that caused the former company to abandon the workings, but it was the failure in the mode of extracting; and this happened at the other gold mines—Cwmheisian, Cambrian, Prince of Wales, and the Clogau Mines, but now we see the Clogau Mines doing wonders at a small outlay, some ground, and similar in quality, and I believe that as good specimens were brought from that mine in 1855 and 1856 as can be produced this day, when they are making from 12 lbs. to 14 lbs. weekly of gold. On the N.W. part of Dolfrwynog sett no work has been done to prove the lode.—The Cost of clearing the Mine: The mine under adit being at present full of water, and the timber above water I cannot say, but I should think them to be sound and good, and should expect to meet several falls of ground in re-opening the mine, knowing the ground to be not so sufficiently timbered, so you will perceive that it is rather difficult to give a true estimate of the amount required to open this mine, though your proposed capital will be more than sufficient. I should recommend that a 4½ ft. wheel, 4 ft. breast, should be erected, so as to give ample power for further workings in crushing, &c.—Water Power: Available from Afon Wen on S.E. side."

Capt. JOHN DAVIES wrote (June 16, 1862).—"In a shallow level driven in quest of copper ore in 1853 a few specks of gold in quartz were first discovered. At my suggestion a shaft was sunk on the course of the lode. As greater depths were attained gold became more plentiful. The shaft in question was sunk still deeper, until it reached the depth of 40 fms., and for the whole of that depth the prospects were most cheering, and the results from the quartz broken out in the shaft and in close proximity thereto were highly satisfactory (see assays and produce).—During the sinking the lode had the appearance of being very massive, and likely to produce an almost unlimited quantity of gold bearing quartz, equal to that in the first two or three parcels. But on extending the levels we discovered that the lode was two lodges, meeting and forming a junction at or near the shaft, and averaging about 8 ft. as we expected. The lodges are of a fair average width, and produce fine friable quartz, but no visible gold beyond the junction. Notwithstanding the disappointment and loss sustained Dolfrwynog has some points of interest, and when reached are likely to be highly remunerative."

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Capt. G. WILLIAMS wrote (Sep. 14, 1863).—"Underground, No. 1 Shaft: The shaft, except in a change of rock, as on washing out the decomposed porphyry and crushing the hard portion, obtained a fair yield of gold. I infer from this that the porphyry, very favourable results may be expected. The small veins now to be seen in the decomposed rock are likely to become concentrated at the immediate change of strata, and form an important deposit of the precious metal. Again, by extending on the lodes in the other direction—towards Cwmheisian—iss, a very well-defined lode will cross your explorations, and form such junctions as are likely to produce good results. The lode was opened by Capts. Northey, Bray, and myself, for sulphur since the gold operations were suspended. Other shafts

have been sunk, and a good deal of work done as described in this report."

Capt. G. WILLIAMS (Jan. 2

I know of one very good reason why public disclosures of the gold extracted were not always made. It is this. Dolfrwynog was private property, and the Crown had no vested right in the minerals. There was, therefore, at the time thought to be no obligation to make to the Crown agent under oath or affirmation any returns of minerals whatever, and that the Crown had no right of entry upon lands of private individuals to search for "royal mines." This notion operated on the minds of some of the owners of the mine for the time being I know, and the idea is not entirely dissipated to this day. The consideration of this branch of the subject will follow in due course.

That a much larger quantity of gold became tangible than was announced I am quite certain, for I have seen more with my own eyes, in its natural state, during occasional visits to the scene of operations than I have seen publicly declared. Besides, I once saw a bucketful of quartz hauled up that was worth at least 350. There was a liberal distribution of specimens to the bystanders, and I came in for a bit which I have now in my possession, worth a sovereign or more. I have been recently promised further details, which I shall give if I get them.—Feb. 23. T. A. READWIN.

(To be continued.)

MINING SHARES—RELIABLE DAILY QUOTATIONS.

SIR.—After having given up all speculation and investment in mines for many years, I have again purchased shares in a few mines recently with satisfactory results, but I find the same highly unsatisfactory state of things in one particular that has always existed still remains the same, and that is the urgent want of reliable daily quotations of all the shares being dealt in, whether such shares are admitted to Stock Exchange quotation of not, or whether they are temporary "pets" of cliques or not. As an illustration of quotations now given, I will select the Van Mine for Monday, Feb. 21, the *Times*, 39 to 41; *Standard* and *Daily News*, 40 to 41; *Morning Post*, 40 to 42; *Morning Advertiser*, 41 to 42. As an illustration of the difficulty of getting a quotation at all, I may mention a mine with excellent and improving prospects which is likely soon to do better—San Pedro (Chili)—although I searched all the papers on Tuesday and to-day, Feb. 22 and 23, not one even mentioned the name, although large business is taking place daily. I have induced several friends to buy mining shares recently, good shares, such as Van, Roman Gravels, San Pedro, Ladywell, &c., but already some are desirous to sell, simply because they find they hold shares subject to sudden changes of value, and have no means of easily knowing the daily prices accurately, and I am quite certain that were this difficulty removed a much larger range of investors would support this market. Can nothing be done? A SHAREHOLDER.

OLD TREBURGETT MINE.

SIR.—In reference to the unreasonable royalty of 1-10th through which this unfortunate mine is on the verge of ruin, I will quote the doings of Mr. Bassett from last week's *Journal*:—"Mr. Bassett has given another proof of his liberality by reducing Cook's Kitchen and Wheal Bassett dues to 1-60th (mark the disparity). We commend the example to those lords—happily there are not many of them, nor, as a rule, is their interest large—who think that the present is a time to insist upon their 'pound of flesh,' and thus do their best to kill the goose that in more prosperous times lays such a store of golden eggs." SHAREHOLDER.

PARYS MOUNTAIN.

SIR.—There is an error in the last paragraph but two of my letter of last week in reference to the ochre pits. It should have been at each "cleaning out" instead of "annually." The next clean out, I understand, will yield about 1000. The precipitate pits it appears yield more than I stated, the last quarter being close upon 750. ARGUS.

SOUTH CONDURROW—THE EXEMPLAR OF TIN MINES.

SIR.—Those who know but disagree with Capt. William Teague's crotchet concerning the non-charging up of the mine-cost while all tin is credited to the day of meeting will have observed with satisfaction the course insisted upon by the Chairman of the South Condurrow. Here we find the largest shareholder saying that "if any attempt were made to declare a larger dividend than had been actually earned in the sixteen weeks embraced in the accounts he should resign his position as a member of the committee;" and with equal firmness did he advocate the desirability of charging in the accounts submitted the cost-sheet due on the following Saturday. One shareholder took a different view, because "such a course was not adopted at Dolcoath," adding "that Dolcoath is not in a worse position than South Condurrow." "No," said the Chairman, "probably not so good."

How many columns have appeared in the *Mining Journal* upon this very subject, and how many shareholders (at least, when transformed into contributors), have had to complain of the pernicious system now generally adopted in all tin mines. Too much praise, therefore, cannot be bestowed upon Mr. Marshall, the Chairman of the South Condurrow Company, for having thus undauntedly set an example which all interested in the future of tin mines would do well to follow.—Feb. 23. STANNUM.

DUCHY GREAT CONSOLS.

SIR.—A correspondent in the *Mining Journal* of last week being desirous of obtaining information with regard to the development of this mine, I beg to forward you the following particulars of the workings from the formation of the present company, and at the same time I would avail myself of the opportunity of mentioning that any enquiries made at the offices of the company are at all times most willingly attended to and answered.

At the commencement of operations, in 1872, it was necessary that that two engine-shafts should be drained, timbered, and secured from the surface; old levels had also to be cleared and made safe, with various other work attending the opening up of former explorations. At the surface also a considerable amount of preparation was required, and for the accommodation of the miners, carpenters, smiths, and others, houses had to be built and others repaired. Two steam-engines have been erected—one a 50-in. cylinder, for pumping, and the other for hauling, crushing, and capstaning. A steam capstan, powerful crusher, and drawing machine have also been placed in the most advantageous position to command the different shafts, with ropes, pulley-stands, &c., complete. To the pumping-engine 200 fathoms of flat or pumping rods, with bobs and other connections, have been attached, and heavy pitwork at South Maria has been fixed to the 80 fathom level. Pitwork has also been fixed in Latchley engine-shaft, and the water drained to bottom of the mine. The operations underground include the sinking of a winze from the 60 to the 80 fm. levels; the 80 has been driven east therefrom 26 fms., and the 74 east 2 fms., and west 14 fms. The 70 has also been driven west of south Maria engine-shaft distance of 65 fms., making the length of drivages between the two mines 105 fms., and a rise of about 9 fms. is now only required to open up a communication between Latchley and South Maria. A new shaft has also been sunk from surface to come down on the winze sunk in the bottom of the 60, making a total depth of 80 fms. from surface, and the operations in different other parts of the mines have resulted in the sale of copper ores realising 1417L, and arsenical muriatic 600L, with an estimated quantity of the latter mineral now on the dressing-floors amounting to 250 tons. I would observe that the mines being situated immediately adjoining the Devon Great Consols, and the stratification being precisely similar to that found in connection with the great deposits of ore in the latter celebrated mines, it has always been considered by practical authorities to be a most encouraging tract of mineral property; and, apart from the reports specially obtained from men of undoubted experience in Cornwall and Devon, the directors have within the past 12 months made arrangements to have the mine carefully inspected and reported upon by a gentleman of authority and sound judgment, recommended from the School of Mines, whose opinion fully bears out the views entertained by those who had before inspected the property. Although it is not in the power of any company to command success, I think I may fairly state that in the present instance no effort has

been spared to deserve it; and, in conclusion, I have only to remark that independently of the particulars supplied to the shareholders from time to time, and the periodical reports in the *Mining Journal*, it will afford me pleasure at any time to give on application any further information that may be required with regard to the development and prospects of the mines. THE SECRETARY.

Great James street, Bedford-row, Feb. 22.

EAST VAN MINING COMPANY.

SIR.—In last week's *Journal* it was stated that the recent discovery of lead ore at this mine was celebrated by a dinner to the workmen, given by the directors and shareholders. This is not the fact. The dinner to the workmen was given at the sole expense of a large shareholder in fulfilment of an old promise.

St. Helen's place, Feb. 22.

F. F. WILSON, Sec.

[The workmen, we believe, were indebted for their treat to Mr. Robert Oldrey, one of the directors of the company.]

BOG MINE.

SIR.—As a shareholder in this mine, and well acquainted with the locality, allow me to give a few reasons for its further working.—

1. The ground in the Bog Mine is much easier than any other in the district, costing from 3d. to 6d. to drive levels, against 10d. to 18d. usually paid in Roman Gravels and Tankerville.—2. A fine deposit of lead has gone down in the bottom level west of shaft, and a very fair one east.—3. A good deposit of blonde is laid open in the eastern part of the mine, which is sold at the highest price in the market—from 6d. to 7d. per ton. The depth of Bog has been objected to, but it is only about the same depth as Tankerville, and 60 fms. or 70 fms. shallower than Snailbeach.

ADVENTURER.

PENNERLEY MINE.

SIR.—It is stated on good authority that the engine on the above mine is quite capable of pumping any extra water from the Bog Mine in case the latter should stop. But even if this is not the case the Bog is on ground so much lower than Pennerley that it would only flood the bottom levels (say) below the 100, which are of less importance than the upper ones. But the richest part of Pennerley—Potter's Pit—cannot be affected at all by the Bog water; it is worked by a shaft 300 fms. east of the old engine-shaft, and is not connected by any levels with the deeper workings to the west.

SHAREHOLDER.

WHEAL GRENVILLE.

SIR.—Mr. T. B. Laws, like most persons who have some time or other come forward on public ground to point out the faults of others, is exceedingly sensitive when a little caustic is applied to his own.

He could not find words strong enough in condemnation of the management of Carn Brea and Tincroft, but as soon as a mine under his own superintendence is the subject of comment he calls it "unmanly and unfair." He says Wheal Grenville came into his hands

encumbered with difficulties, and does not hesitate to charge the old agents with having caused the machinery both at surface and underground to get into a deplorable state through sheer neglect. If all this be true, did not the encumbrance of debt and defective machinery exist under the old management, and how was it the former agents could with all these difficulties return more tin than the present parties?

I suspect this charge about the machinery will be found as groundless as the numerous charges made by Mr. Laws when agitating for a reformed management. It seems extraordinary that Capt. Seccombe, whose report the Chairman of the last meeting alluded to as "a very full and exhaustive one, so different from the sameness of ordinary reports," did not allude to the "deplorable state of the machinery." On the contrary, Capt. Seccombe said, "the returns of tin might be increased by attention being given to breaking the best parts of the lode." Now, Capt. Seccombe would not be likely to anticipate larger returns of tin, however productive the lode, if the machinery were in such a condition as Mr. Laws describes. It is, therefore, very palpable that the present London management is now beginning to see that none of Mr. Laws's promises as agitator are likely to be fulfilled, and they will, therefore, bring forward this excuse of the "deplorable state of the machinery" before the shareholders as the cause of the non-realisation of Mr. Laws's prophetic inspirations. Probably the shareholders will again act the part of the credulous as they did in regard to Mr. Laws's golden promises. Mr. Laws thinks that more time ought to have been allowed the new management before passing judgment upon it. Well, this shall be my last letter for some time to come, but he may rest assured that all his proceedings will be closely watched and commented upon in the future. I have no personal feeling in the matter, I write as Mr. Laws did in the matter of Carn Brea and Tincroft Mines, on public grounds, and in the interest of mine agents. I look upon the late changes at Wheal Grenville as a question affecting every person in the service of a mining company. Agents of integrity and great mining experience were summarily dismissed upon unsubstantiated charges made against their character. Assertions and promises were made and given that the result of the change would be an immediate improvement in the affairs of the company. So far these loud assurances have not been verified, and, Sir, any other persons have as much right, and a far more justifiable one, to make comments upon the matter as Mr. Laws has to pass censure upon mines where the financial arrangements do not accord with his own views.—Camborne, Feb. 22.

F. L. A. T. RODDA.

WHEAL PEEVOR, AND ITS LATE MANAGEMENT.

[The following letters have been addressed to the Editor of the *West Briton*.]

SIR.—In the report of the meeting lately held on this mine, Capt. James made several statements respecting the mode of working, which are at variance with the generally received notions of other mine agents, and in which he stands alone, or almost so, in his opinions; and in the working of this mine has carried his theories into practice to an extent that is believed to be very prejudicial to the interests of the shareholders, and it may, therefore, be just as well to further ventilate the subject. It is well known that Capt. James has been in the habit of selling the greater portion of the tin-stone to bargain buyers, as they are truly called, and in defence of this mode of procedure he stated at the meeting that the company had made a profit of more than 6d. per ton on black tin beyond what they would have made had they stamped the tin themselves, and he went into a long array of figures to prove his assertion. The value of these figures may, perhaps, be best judged by a statement of facts.

The tin-stone at Wheal Peevor is sold by ticket to a great many persons who own stamping-mills within 10 miles of the mine, and who carry the tin-stone to their stamping-mills at a considerable expense, and there stamp and render it marketable. It is but reasonable that persons who are so engaged, and have been so for many years, and understand tin dressing better than any other men in Cornwall, should expect to make some profit by their transactions—in fact, a fair remuneration for their time and risk, and capital employed.

When it also becomes known that some of the principal of these tin buyers are able to obtain sufficient water-power to stamp their tin-stone, and that a large proportion of the tin-stone from Wheal Peevor is stamped by them by steam power, it would really seem to be common sense that the said tin-stone could be stamped and dressed on the mine quite as cheaply as it could be stamped and dressed by other people at a distance; the carriage also for 3 or 6 miles, as the case may be, being a loss sustained by the Wheal Peevor Company, as well as the profit made by the buyers of the tin-stone.

By way of bolstering up a bad case, Capt. James also asserted that the West Bassett and East Pool Companies were benefited by selling their tin in the stone. But when it is remembered that the East Pool Company have, until recently, stamped the whole of their tin-stone, and that the reason of their now selling tin in the stone is entirely in consequence of their having a greater quantity than they can stamp out, but that they have recently added 16 heads to their steam stamps, and have a further addition in contemplation, it is evident that the agents of that mine do not share the same views as Capt. James with respect to the selling of tin in the stone. West Bassett also sold large quantities of tin-stone from the same cause. But when we look at the very large outlet recently made by them to put up a second steam-stamp, amounting to many thousands of pounds, so as to be able to stamp the whole of their tin-stone, it is evident that in this case also Capt. James must be seriously in error, or else the agents of that great mine cannot know their business.

At Wheal Peevor the burnt leavings have been carted from the burning house yard back to the temporary stamps attached to the whim-engine, and are there passed through the same stamping-gate they have been through before; and one of the miners jocosely says that "some of the said burnt leavings have been through the stamps so many times that every grain knows by experience what particular hole in the gate he has to pass through, and makes his exit from the cover before the stamp head can possibly strike him." At all events, the absurdity of treating burnt leavings in such a manner as this is apparent to anyone who has any knowledge of tin dressing.

There was also one other statement made at the meeting which may be fairly commented on. Capt. James said that the mine would never pay cost at the present

price of tin, apparently forgetting that four months since he stated at the account meeting that from that time forward the mine would pay cost. And also the fact that since that meeting a valuable discovery of tin, reputed worth 65d. per fm., has been made in the engine-shaft. Some people ought to have good memory. Taking the results of the past as a guide, the statement of not being able to pay cost at the present price of tin may not be so far out of the way. But how has the tin been worked? The 36, containing a lode valued under the mark at 17d. per fathom, cost of driving 7d., and worked by two men only. The 48, driven 6d. fms. west of shaft through a productive lode nearly all the way, and no means provided for discharging the tin-stone except by a wheelbarrow, not an inch of tramroad in the mine, the miners throughout the mine being obliged to wheel their own tin-stone, as well as to fill it into the kibble, and, consequently, being seriously hindered in opening levels, &c., everything tending to retard the operations; and the number of fathoms of ground laid open by levels not being more than one-third of what should have been; calls being made to cover the deficiencies in the returns, and the local shareholders very sick of the whole proceedings. No mine in Cornwall could pay costs if conducted as Wheal Peevor does. Dolcoath would be a losing mine if they sold their tin in the stone; and even East Pool is only making their profits by having a large number of points in operation at the same time. The idea of sustaining Wheal Peevor by sinking a shaft and partially driving three levels only is certainly one that cannot command itself to those who are acquainted with practical mining.—Feb. 22.

A SHAREHOLDER.

WHEAL PEEVOR.

SIR.—In your Monday's edition you have quoted the remarks of Messrs. Pryor and Michell respecting the tin assaying of this mine—"That it was not worth the paper on which it was written," &c. Will you be good enough to insert the following? All the tin samples of this mine were assayed by Capt. Whitburn for a period of twelve months, who, I believe, is in this particular capacity second to no man in the county. When Capt. Whitburn was first appointed the purse, and his friends were very pleased with him, and raised his salary accordingly. Unfortunately this feeling, like a sunbeam, did not last through the winter, for Captain Whitburn has such a thing as a conscience, and a reputation for tin assaying which many shaft burrows. I have above stated that Capt. Whitburn assayed the samples for the stamps, and against the tinstone buyers, and the result is only a difference of about 7 cwt. of tin between the quantities sampled and sold for a period of twelve months. If Capt. Whitburn's assaying for the stamps was wrong, that would be some reason for the remarks of Messrs. Pryor and Michell, that his assaying for the tin buyers was not worth the paper on which it was written. Those who know both Capt. Whitburn and his detractors will be best able to value such statements.

Now a few words respecting the new tin assayer. Ever since Capt. White's appointment he has been assaying the samples for the stamps, and the result, in 16 weeks, is about 24 cwt. of tin sampled more than has been sold for the same period, the same rules on the dressing-floors having been strictly carried out as when Capt. Whitburn assayed the samples? Now, what does this show? That either the dresser has relaxed his duties, or that Capt. White is not careful enough in his assaying the samples. Without expressing my opinion upon this subject, I leave your readers to judge for themselves.

When I accepted the management of the mine I found a deficiency of 9 tons of tin. That has never been accounted for from that day to the present. This is due to the recent deficiency, will make between 10 and 11 tons of tin ore that will probably never be accounted for. Had the tinstuff which produced this quantity of tin been sold in the stone to the buyers this great loss would not have been incurred. I find by experience that they buy every particle of tin that a good assayer can make of it. This is one reason for selling tin in the stone, and the second is equally important—that it costs about three times as much to stamp a ton of tinstuff at Wheal Peevor as it does in other mines. A goods stamp will require a ton of hard tinstuff with the consumption of 84 lbs. of good coal. At Wheal Peevor the average of 12 months is about 224 lbs. I have no objection to a good stamp being erected, provided the prospects of the mine will warrant the outlay; but I have very strong objections to a thing called a stamp being erected in the place of one.—Redruth, Feb. 22.

A. T. JAMES.

WHEAL WREY, LUDCOTT, AND NORTH TRELAWNY.

SIR.—I had concluded, as well as most others who had been induced to take shares, that this concern had dragged out its weary existence, and had entirely collapsed, after the strenuous opposition which had been given to it by the local shareholders since the time of allotment, on account of its insufficiency of capital and other causes before alluded to, but we were somewhat surprised this week by receiving a circular intimating there had been a meeting of the directors (but how many is not stated) held at Mr. Endean's offices in London, and a call of 10s. per share was made "to discharge the existing liabilities of the company and wind-up the concern," but the number of shares is not mentioned on which the call (which is quite illegal) is said to be made, or what the liabilities are composed of. Surely this requires some satisfactory explanation. I am at a loss, as well as all the locals here, to know what this exorbitant call is intended for, supposing it is responded to, which is very doubtful, it must amount to a considerable sum of money if the statement of one of the local directors is true in reply to a question asked by Mr. M. W. Baden at Liskeard allotment meeting how many shares were applied for, but his assertion of 4000 shares must be incorrect, and is now being verified. The actual legal (or doubtful) recoverable expenses must be exceedingly limited as no money has been spent on the mine, and if I am rightly informed (promoter can say) not one of the leases has been executed by virtue of lease of back note, which is nearly expired. I would suggest to all those interested in this unfortunate affair to protest against any demands that may have been made by the remaining directors until the whole accounts have been thoroughly sifted and a correct statement produced, with a legitimate investigation of all expenditure duly audited, discharging all promoters' premium, directors' fees, and all other illegal and exorbitant charges and unnecessary expenses said to be incurred by them. A statement of accounts has now been presented to the shareholders. Probably if an application is made to the Vice-Chancellor to appoint a liquidator, one having no connection with the present officials of the company, who would make a fair adjustment of actual costs to be allowed, which would be very trivial, and could not possibly amount to 24, 3d. per share for all preliminary expenses. I hope the local opposition committee will watch the proceedings, and if necessary, carry out the suggestions recommended by their solicitor—Mr. J. G. Chilcott, of Truro—which would probably place the instigators of this concern in a most unenviable position.

Liskeard, Feb. 23.

PENNERLEY MINE (LIMITED).

SIR.—With reference to the letter signed "Investor," in last week's *Journal*, permit me to say that your correspondent has by error stated the Wheal Pit end is really worth 45s. per fathom, and promises to rival Tankerville, whereas it is in fact worth by last report 50s. per fathom. Again, the mine has just sold 1200. worth of ore, and in the 120 fm. level, at engine-shaft, the lode is gradually improving as the miners work eastwards, and is worth 1 ton per fathom already. With present prospects, and adjoining Tankerville ground also, Pennerley Mine ought to become one of the regular dividend properties of Shropshire, and as depth is attained no doubt rests in the minds of practical men that this must be the case. The driving of a 90 fm. level at Potter's Pit end must result in a large accession of wealth and increased returns. This important point may be very shortly expected to come off, and the fact of the heat at this part of the mine, below the 75 fm. level, for itself that a large body of ore will be almost immediately struck, and Pennerley Mine will then be properly appreciated and fairly quoted on the Stock Exchange.

SPECTATOR.

[For remainder of Original Correspondence, see to-day's *Journal*.]

HANGMAN BURROW—THE FOX HUNT.—This celebrated heap of stones was collected nobody knows when, although some know old people say it took place in the reign of King David, or Solomon, and to commemorate a great fight with the inhabitants of the parishes of Crowan and Camborne. It is an enormous heap of stones, and situated near the borders of Camborne and Crowan parishes. Some years ago Hangman Burrow was selected as a central spot for a grand fox hunt, and there assembled on the occasion a great number of horsemen and hundreds

lodes going west?" "Iss, that's ov'a," said little Jan, "throw to 'un, Tommy my son; where's the Gwennap lodes going west?" "If you'll bark to me for a bit," says Jemmy Dowa, "I'll tell 'ee a d—s course I had with Becky, the landlady of the Wild Duck, and a—s think a—s worth hearken to. I had a pint of ale, when Becky said 'What doesn't a think, Jemmy, of this district; doesn't a think there will ever a bal be found in it?'" "Why," I said, "Penstruthal and Tresavean lodes must run thro' 'un. And how is it, Becky, they are not good here as well as there?" "Eess that all thee's know about it," said Becky, "thee'st like the rest; and cousin Will (Cousin Will, the landlord, was cousin to everybody) last night he was the biggest buss-head than ever lived, to take a share in the little bal to the south of the house, in our craft. And then, again, there's West Penstruthal, Box-better sett, and Wheal Richmond. I tell 'ee, Jemmy they're moorstone bals—moorstone as hard as blazes, all the way from Bluestone Down to Wheal Richmond on the Nine Maiden Downs." "But do you mean to say, Becky, that the Gwennap lodes don't run through this here district?" "No," said Becky; "but the life is squeezed out of them with the hard moorstone; and in easy ground, such as Bolenowen Cairn and the high downs up by Hangman Burrow the same lodes will be so good, as they war in Gwennep?" "It's my opinion," said Uncle Henry Tregon, "that Becky is right; for I mind very well, after Tommy's dowsing, that Jacky Hensby cut as fine gossan lodes in sight of where we stand as any man could wish to see." "And I see'd as pretty gossan and man lodes cut in Bolenowen Cairn," said Uncle Jan Jewill, "as any man ever see'd in Gwennep." "This is new ground and good ground," says little Jan Bemby, "and will make rich bals; but I should as soon think to find tin and copper up in my old Talfot as in a moorstone rock." "I am glad," said Capt. Ned, "that I came here to-day, and I thank you all for your opinions, which, probably, but for the 'fox-hunt' would have remained secret."—*Cousin Jack's unpublished M.S.*

Greetings of Public Companies.

PHOSPHOR BRONZE COMPANY.

The second annual general meeting of shareholders was held on Wednesday, at the offices of the company, Cannon-street, Capt. Sir J. E. COMMERELL R.N., V.C., K.C.B., in the chair.

The SECRETARY read the notice convening the meeting, and the report of the directors, with the balance-sheet and revenue accounts submitted to the shareholders, were taken as read, and adopted after some discussion respecting the dividend recommended—8 per cent.

The CHAIRMAN congratulated the shareholders on the continued success of the company and the encouraging prospects for the future business.

The retiring director, Mr. J. W. Bushby, was unanimously re-elected, and Mr. Frithjof Plahte was elected to a seat at the board.

After the re-appointment of the auditors and an expression of approbation of the services of the managing director (Mr. G. A. Dick) and the officers of the company, a cordial vote of thanks to the Chairman and directors was unanimously carried, and the proceedings terminated. The following is the directors' report, submitted to the shareholders:—

Since the issue of the last report on Feb. 18, 1875, great depression and stagnation have existed in those trades which are the chief sources of business for this company, and this has been the case principally with ironworks and the larger engineering establishments, which when in full work send considerable orders for casting of phosphor bronze. Your directors, however, have much pleasure in informing you that, notwithstanding these drawbacks, the sales during the past year, as compared with the previous nine months, show an increase of over 100 per cent., being principally on the quantity of ingots, which are now largely purchased by brassfounders—a significant fact, proving that the superior qualities of the metal are becoming appreciated by their customers, who specify that their castings should be made of phosphor bronze. The various branches of Government have late increased the number and magnitude of their orders, and as phosphor bronze is now specified by them for a variety of purposes, your directors feel justified in anticipating large contracts from this quarter, and also from the chief engineering establishments in the United Kingdom. Several foreign Governments, after extended trials, are also beginning to adopt the metal. Many of the large shipbuilding firms have during the past year given orders for ingots and castings of phosphor bronze, and a considerable increase of business from this source may be expected, not only in this country, but in the colonies and abroad. Phosphor bronze pit-ropes are now in use in Germany and Belgium, several of the highest mining authorities having recommended them on account of the great strength of the metal, and its non-liability to rust. When the difficulties in the way of rolling and drawing the metal properly have been overcome a large trade in phosphor bronze tubes, pit-ropes, wire, and sheets may be confidently anticipated, and it may be found advisable to establish rolling-mills and wire-works to enable the company to execute with greater promptitude the various orders which they are now compelled to entrust to others.

Numerous novel applications have been found for phosphor bronze; amongst other articles may be mentioned steam fittings, which have been much approved of on account of the beautiful colour of the metal and its great durability. Several makers have purchased phosphor bronze in ingots for the manufacture of these important articles. The arrangements with respect to the purchase-money due to the liquidator of the Pioneer Company, referred to in the last report, were adopted at an extraordinary general meeting of the members, held on June 2, 1875, and have since been carried into operation. The prospects of the company are in every respect gratifying, and your directors confidently look forward to an increase in the sales during the present year, corresponding with the improvement of the business during the past year on the previous period of the company's trading. It is, however, essential that the active capital keep pace with the extension of the business, to ensure its proper development and efficient working; your directors, therefore, propose for the present offering for subscription 500 shares. Although the amount of profits disposable would pay a dividend of nearly 12½ per cent. upon the paid-up capital of the company, your directors consider it right to recommend a dividend of 8 per cent. only, and to carry the surplus forward. The accounts now presented have been audited, by the auditors appointed by your directors, under the power given them by the company's articles.—R. LAGERWALL, Sec.

THE DIAMOND ROCK-BORING COMPANY.

The fourth general meeting of shareholders was held at the offices of the company, on Saturday last.

Major BEAUMONT, R.E., M.P., in the chair.

The notice convening the meeting having been read.

The CHAIRMAN congratulated the shareholders on the continued prosperity of the company, and stated that the company had lately constructed machinery capable of boring Artesian wells, as well as for prospecting for minerals. Having referred to the Sub-Wealden bore-hole, which was carried to a depth of 1825 ft. Aug. 31 last, and financial considerations on the part of the exploration committee, preventing them from paying for the necessary tubes, the company took upon themselves the responsibility of widening the bore-hole, so as to continue the depth to 2000 ft. at least, which depth he hoped would be reached in a few days. As a proof of the ease and rapidity with which great depths could be reached by the Diamond Rock Company's machinery, he would just mention one or two instances—at Rampside, in the Barrow district, 60 feet were bored within a week 2000 ft. from surface.—[Finally referred to in last week's Journal.]

In Switzerland a bore-hole had been carried to a depth of nearly 1600 ft. in two months. In Prussia 500 ft. had been bored in a fort-night, carrying a bore-hole from 1500 to 2000 ft. deep—a rate of speed heretofore unprecedented. The subaqueous operations in the Tees had been perfectly successful; three-fourths of the work had been completed, and the directors were now in negotiation for contracts of a similar nature. It was, of course, a simple matter to remove rocks at a depth under water of from 2 to 3 ft., but when the water was of a depth of (say) 25 ft., it was a different matter, and for such operations he (the Chairman) considered the superiority of this company's machinery had been quite established. He might also state that the company had now a percussive drill, which he considered as second to none, and which would very much facilitate any work in soft strata and in shallow holes. To further facilitate work the company had started working their machinery night and day, and it was hoped by that arrangement they would greatly shorten the time in completing the work, thereby further securing the approval of those by whom they were employed. Having entered into other details in reference to the operations of the company, the Chairman moved the adoption of the report and accounts, which was agreed to. The dividend was declared, and the retiring directors and auditors were re-elected.

The proceedings terminated with a vote of thanks to the Chairman and directors.

The following is a copy of the directors' report for the meeting:—A demand for the company's machinery has sprung up in a direction not originally anticipated—the putting down of bore-holes for water. Artesian wells require a larger diameter of hole than what is sufficient for prospecting purposes. To meet this demand the company have constructed a larger and more powerful machine

than those previously in use. This branch of business, the directors believe, will when further developed form a considerable source of profit to the company.

The boring at the Sub-Wealden has been continued during the past year, and a depth of 1825 ft. was reached on Aug. 31, when the work was stopped, owing to the strata requiring more lining. Financial considerations on the part of the exploration committee made it impossible for them to find the necessary tubes, and the enterprise would have been discontinued had not the company taken upon themselves the responsibility of widening and lining the hole and continuing the work. A depth of 2000 ft. will, it is expected, be shortly reached, after which it is anticipated that the exploration committee will be able to find further funds to continue the research to such a depth as will prove the geological underlie of the Wealden. As a proof of the ease and rapidity with which great depths can be reached with the diamond drill, at the Rampside boring in the Barrow district 60 ft. was bored within a week, exceeding 2000 ft. from the surface, and perfectly satisfactory cores were obtained.

The company's sub-aqueous operations on the Tees have been entirely successful, and three-fourths of the contract for the removal of the rock has been completed. The directors are now in negotiation for other contracts of a similar character, and they consider that for such operations the superiority of the diamond drill system has now been firmly established.

The last report stated that the company's plant employed on the Clifton Tunnel would be removed to the Maesteg Tunnel for the Llynny and Ogmore Railway Company. This has been done, and the new contract upon which it is employed is in full and satisfactory operation.

The operations of the Foreign and Colonial Tunnelling and Prospecting Company (Limited), which was formed in March, 1874, for the purpose of working this company's patents on the Continent and elsewhere abroad, have been entirely successful, and a sum of £58,150. 12s. 1d. was received from them in March, 1875, being the proportion of profits due to this company on the result of the first year's working. The directors have reason to anticipate that the results of the current year's working of the Foreign and Colonial Company will be equally satisfactory.

According to the Articles of Association, two directors retire—Major Beaumont, R.E., M.P., and John Hick, Esq., M.P.; both being eligible, they offer themselves for re-election. The auditors, Messrs. Deloite, Dever, Griffiths, and Co. also offer themselves for re-election, and the board recommend their re-election to the shareholders. The audited balance-sheet for the year shows that the third annual instalment of £58,150. 12s. 1d. has been written off the account for preliminary expenses, and a sum of £4,000. has been written off the plant account, for depreciation, in addition to the sum charged to contracts for repairs and renewals, which enables the company to keep their plant in good and serviceable condition.

The directors recommend that a dividend to the shareholders be declared at the rate of 10 per cent. upon the called-up capital of the company for the year ending Dec. 31, 1875, part of which, calculated at the same rate, was paid on account in August last. This will absorb 92,647. 2s. 3d., leaving 20,717. 9s. to be carried forward.

According to the Articles of Association, the directors' fees were fixed at 1500/- per annum, and the managing director 600/-; but the directors have altogether only drawn the sum of 1150/-, and placed the balance (950/-) to the reserve fund, as was done last year.

The directors further recommend that an additional sum of 1550/- be placed to the reserve fund out of the profits of the year, making the amount of reserve fund up to 4000/-, and carry forward the balance, 521. 9s., to next account.

The directors regret that owing to press of other work, which induced him to tender his resignation, they have lost the valuable services of Mr. John Pender, M.P., as chairman. With a view to economy of administration, it was thought advisable that the office of the chairman and the managing director should be merged in one person, and the board have consequently elected Major Beaumont, R.E., M.P., to fulfil these duties.

NORTH PRINCE PATRICK LEAD MINING COMPANY.

A general meeting of shareholders was held at the offices, London Wall, on Tuesday,—Mr. E. HILTON in the chair.

The directors' report stated that it would have afforded the directors very great pleasure on this their first annual general meeting, to have been able to assure their fellow-shareholders that the mine was so far developed as to enable them to declare a dividend, which they hoped to have been in a position to do, but they have had numerous and unexpected difficulties to encounter, most of which they have resolved to believe are overcome. They are, however, glad to say that from careful dialling they are within a few feet of cutting the Pwll-y-Gaseg lode, which is the champion lode of the district, and should this be cut rich (of which there is every reasonable probability) they will, at no very distant date, be able to declare dividends. They have themselves supplied a great portion of the capital to work the mine, and the shareholders may, therefore, be assured that no effort will be spared to bring about satisfactory results.

The agent's report was read, as follows:—

Feb. 17.—Engine-Shaft: This shaft is sunk on a lode parallel to the Silver Rake to a depth of 60 yards. The workings out of it consist of a level driven eastward for about 35 yards through the most unmanageable ground I ever had to drive through. We had at one time to draw the stuff that had fallen in from the roof for 10 days without being able to stir from the same spot, but we managed to timber it at last, and so were able to go on with the driving of the level until we were stopped. The group I in the forebore contained favourable indications for lead. Another driving for 8 yards or so was started westward along a flat which yielded small quantities of lead, although I believe this part of the mine will turn out well in time if judiciously worked, I would not advise the resuming of operations here for another month or two, as the water is so strong. Timber has been purchased for covering in the engine, which will be done without delay.—Eastern Shaft: This shaft is sunk on the Garreglwyd lode to a depth of 80 yards, and a cross-cut has been driven to the lode mentioned above, along which we have driven a level for 68 yards for the purpose of intersecting the Pwll-y-Gaseg lode, which is quite a master lode, bearing a north and south direction. The ground we have driven through is of the most obstinate kind all along, but at the present it is much harder than ever, which inclines me to believe we are in the hanging side of the vein, and we may expect to cut it daily, when I trust we shall soon raise lead in such quantities as to repay the company for all their outlay.—J. JONES.

The balance-sheet having been read over, the CHAIRMAN briefly commented on the difficulties they had encountered in the working of the mine, and on the fact that their first issue of shares had not been sufficient to bring the mine to a paying state. But more capital had been obtained, and they expected shortly to cut the Pwll-y-Gaseg lode, which, it was expected, would yield large quantities of lead. He then moved that the directors' and agent's reports and the balance-sheet be received and adopted.—Mr. WALKER seconded the proposition, which was put and carried.

Mr. Joseph Taylor was voted to a seat at the board, and Mr. Buffen was re-elected auditor.—A vote of thanks was passed to the Chairman and directors, which closed the proceedings.

AMBROSE LAKE TIN AND COPPER MINING COMPANY.

An extraordinary general meeting of shareholders was held at the office, London Wall, on Tuesday, for the purpose, if deemed expedient, of passing a special resolution to authorise the directors to issue 5000 ten per cent. 2d. preference shares.

Mr. JOSHUA MOSS in the chair.

Mr. W. EATON (secretary) read the notice convening the meeting. The report of the directors stated that after great efforts and many disappointments your directors were able some months back to report that they had reached the Wheal Sisters lode, out of which the company were working the adjoining mine raised and sold, it is said, considerably over £70,000. worth of good copper ore. When first cut in Ambrose Lake, the lode had every indication of being rich in depth; a deeper cross-cut was, therefore, commenced, and the lode intersected 14 fms. lower down, where a good course of copper ore was met with, proving that the anticipations of your directors were well founded. This work entailed a large expenditure of cash, as owing to an influx of water from the Wheal Sisters lode, a fresh lift of pumps had to be put in the shaft. Results, however, have justified the course that was pursued, as the lode at the various points of operation is valued at over 6 tons per fathom.

Some time ago your directors secured the Tin Valley sett adjoining the Ambrose Lake. This has proved of immense advantage to this company, inasmuch as our ore contains a large amount of arsenical muriate, which it was found would pay well to extract. The company, however, had no power to erect kilns for extracting arsenic on the Ambrose Lake Mine, and had they had power to do so it would have cost several thousand pounds to build flues and chimney stacks for that purpose, while on the Tin Valley Mine these, together with burning ovens, were already erected. These buildings, with the addition of reduction and refining works, which are estimated to cost about £1500/-, would enable us to make large profits, as there is on the Tin Valley sett a large quantity of arsenical muriate. Six new kilns have been erected, and are producing about 8 tons of arsenic per month. This is sold at about 6/- per ton, but if refined it would realise 13/- to 14/- per ton, and the extra cost would be only about 5/- per ton. An estimate has been given by a practical chemist, showing that a profit of at least 100 per cent. can be made if the necessary works be put up.

With the view, therefore, of meeting the expense of erecting the requisite reduction and refining works, your directors propose to issue 5000 ten per cent. 2d. preference shares, as the capital of the company is already exhausted, and in order to develop the mine and make it profitable it will be necessary to put out another cross-cut from the bottom of the shaft, which is 14 fms. below the present workings. This month the company is sampling about 30 tons of copper ore and 8 tons of arsenic. Your directors are fully alive to the disappointment felt by their fellow-shareholders, inasmuch as they themselves have sunk a large amount in the mine, but in view of the recent improvements, and the present development of the mine, they trust that the shareholders will not allow their disappointment to prevent them supporting this effort to save a property which has every prospect of becoming highly remunerative to the proprietors. The board will be glad if you can join them in this matter; should you intend doing so, kindly fill up the enclosed application form, and return to us at your earliest convenience. We shall be glad to see a good number of shareholders at the meeting.

The report of the agent was read, as follows:—

Feb. 21.—I am pleased to inform you that since my last monthly report the bottom level has been driven west on the north lode about 8 ft., and to day we have taken down the lode, which has further improved for copper; it is now 2½ ft. wide, and worth I consider 14/- per fathom for copper, and I am of opinion that there is still more lode standing north, as all the water is coming from the side, and very coppery; the lode in the end is of the same value as when last reported on, and I cannot see much alteration in the stopes; I think since the last taking down of the lode it has improved somewhat. On the middle lode we have driven east about 10 ft.; here the lode is not quite so good for copper, but I like the appearance of it, and I believe we shall soon have a good improvement in this end; the lode is thrown north 3 ft. out of its course. The stopes in the back of this level are producing just the same quantity of ore as before, and I consider we shall have a much better sampling than the last if the lodes hold as they now are. We are to-day cleaning out our arsenic chambers, and shall send off a good parcel this week. We have hundreds of tons of muriate now at the surface lying in the tin valley old burrows, and we can keep going twelve kilns as well as six. I would recommend that more be put up at once, as the cost of burning would be much the same. If our mine were only 20 fms. deeper we should have one of the best paying mines in Cornwall. I am of the same opinion as I always have been, and we have seen more mineral already than we might expect it at such a shallow depth, and if we had another level opening on these lodes we should be making good profits with the copper and muriate that we could raise.—F. TEMBY.

The CHAIRMAN said he could simply state the fact that must be

apparent to every shareholder, that just as they were reaching the goal so long looked and worked for, and had incurred great expense to attain, their capital was exhausted. The circumstances were such that the directors felt themselves fully justified in coming before the shareholders to ask them to provide the further necessary means to bring about the remunerative result apparently so close at hand. He moved that this meeting authorises the directors to issue 5000 10 per cent. shares of 2/- each. He added it was understood that the directors had authority to issue these shares as they in their discretion may deem best. The directors hoped and believed it would be the means of making the mine one of the best in the district.

Mr. MEGINN seconded the proposition, which was put and carried.

A vote of thanks was passed to the Chairman and directors.

The CHAIRMAN acknowledged the vote, and assured the shareholders that no effort would be spared to continue to merit their confidence.

The proceedings then terminated.

NEW CWM ELAN LEAD MINING COMPANY.

A general meeting of shareholders was held at the offices, 110, Cannon-street, on Thursday,—Mr. HENRY BROWSE in the chair.

Mr. C. ELEY (the secretary) read the notice convening the meeting.

The report of the directors stated that the shareholders were reminded that the lease of the Cwm Elan Mine, with all the substantial buildings, and the mining and dressing machinery thereon (the whole of which had cost the former company £26,000/-), have been acquired by this company for £14,250. The whole of the property has been obtained and the new company formed for little more than £2000. The lead and blonde ores sold represent a value of £16,000/-, and in addition to this there was £132/- worth of ore on the mine, in course of crushing and dressing, on Dec. 31 last; of this sum £98/- has been received, and appears in the accounts of that date. The directors consider this a most satisfactory result from the first year of the company's operations, especially as the cost of the mine and the formation of the engine-shaft has been lowered to the 30 fm. level, and the level driving north and south. This has laid open the most productive ground yet seen in the mine. The manifest improvements that have taken place as the deeper levels are driven have satisfied your directors that valuable results are in prospect if the mine can be developed to still deeper levels. To do this, however, and to construct a reservoir for a reserve of water in the summer months, more capital is needed; the directors are desirous of obtaining the opinion of the shareholders upon this point. The sum of 233/- of the expenditure shown in the accounts should be charged to the purchase of the property and works of development; this will leave 916/- 8s. 9d., the cost of producing the ore which has been obtained, or a profit of £312. 18s., as the result of the year's operations.

The following report from the local agent was read:—

Feb. 19.—I beg to inform you that we are still driving by the side of the lode in the 30 fathom level, west of shaft, at a point near the forebreast; I ordered the men to cut it to 2½ ft., and, judging from this point, the standing lode will turn out when taken down something better than we have seen hitherto in this level. I propose to take the lode down in the ensuing week, and will give you the value in my next. The lode in the 30, east of shaft, on the south lode, is worth 18 cwt. of lead and blonde ores per fathom, and improving; water is coming in large quantities from the end, with other good indications. The present appearance of the lode, after being disordered by a cross-course, is now presenting an important feature, which induces me to think that before long we shall meet with a valuable piece of ground in each of these levels; from the engine-shaft to the present ends we have good paying ground to stop to the 20, which is untouched in the way of stoping. The south lode, in the same level, is looking much the same as reported this day week, still I am expecting an early change for greater produce of lead ore. The winze sinking under the 20 west has improved since I wrote you last; the present value is 20 cwt. of lead and blonde ores per fathom. The various stopes throughout the mine are yielding their usual quantities of ore. In conclusion, to take a general view of the mine, I must say that every point of operation is most encouraging, and when the weather permits our returns will be more regular.—W. GOLDSWORTHY.

The CHAIRMAN moved that the report and accounts be received and adopted. He mentioned that Capt. Roach, the manager of Van Consols, had inspected the mine, and his report could not but be considered as highly satisfactory. It was as follows:—

Feb. 28.—In accordance with your request, I have recently inspected

The shaft was commenced at the former proprietor's own cost, and it was not long before it sunk into the barytes, so that if any doubt existed before as to the extent of the deposit it seemed set at rest by the sinking of this shaft. In most mines a long period was taken up in developing the property, but here delay should be avoided because shafts were already sunk, levels driven, and machinery erected, and, as far as he could judge, he hoped to see dividends commencing from this year. The company possessed about two miles through which the lode ran, so there was room for half a dozen mines.

Mr. EASTES seconded the resolution for the adoption of the report and accounts, which was put to the meeting and carried.

Mr. BARTLETT, in answer to a shareholder, said there would be no great difficulty in obtaining a market for the barytes.

Mr. H. M. OMANNAYE said he had examined the property thoroughly, and from all he had seen and heard he believed the company possessed a property which would be highly remunerative.

After some further unimportant discussion, the proceedings closed with a vote of thanks to the Chairman and directors.

SOUTH CARADON MINING COMPANY.

At a general meeting of shareholders, held at the mine, on Tuesday (Mr. RICHARD HAWKE in the chair), the accounts for tenth, eleventh, and twelfth months showed a profit of 1139/- 5s. 2d. A dividend of 1024/- (2/- per share) was declared, and the balance of 2318/- 18s. 11d. carried to credit of next account. The following report was read:—

Feb. 22.—Since our last meeting we have driven the 170 fms. level cross-cut (referred to in my last report) a little further south of Rule's shaft, and intersected the main part of the lode, which, I am pleased to report, is productive, although not a rich course of ore, yet such as can be worked at a profit. In West Caradon part we have cut the cross course, and are now driving on it to intersect the western lode of the mine. I am pleased to say that the mine in its various parts is looking as well as it has for some considerable time past.—JOHN HOLMAN.

WEST MARIA AND FORTESCUE CONSOLS.

At a general meeting of adventurers, held at the purser's offices, Hope-street, Glasgow, on Feb. 18 (the Purser in the chair), the accounts and vouchers from Sept. 10 to Dec. 31, both inclusive, being five months' costs, showed a debit balance of 240/- 2s. 1d. The meeting having considered the requirements of the mine for the next four months, did not think it necessary to make a call. In regard to the suit, the committee submitted the award of the umpire, which was in favour of the company, and which the meeting considered satisfactory. The committee reported as to the boring machine that after careful examination and inspection they had come to the conclusion that McLean's was the best. Plans were laid before the meeting, and it was agreed that one should be bought, along with the requisite appliances, and the remit to the committee for this purpose was continued.

Capt. W. SKINNER, the manager, in his report, says:—"We have not yet got the boring machine, but hope to have it on the mine soon, as it is very important that the shaft should be sunk with all speed to reach the junction of the north and south lodes, at which point we look for good discoveries of copper. This mine is only now 104 fms. deep. There are many points we consider to be of great importance which we should have proved long ere this if we had had the means of doing so. The greater portion of the returns made during the past year has been from the stopes in the upper levels, which were suspended eight or nine years ago, owing to the low price of copper and muriate. The new calciner is nearly all fixed, and will be ready to work in a very short time. Owing to the large quantity of stuff we have now to burn in the kilns, we are building a large addition to our flues for the purpose of securing the arsenic as we increase the burning. We are pleased to say that our last sampling of copper ore was 220 tons, and that we have now several hundred tons of muriate ores on the floors ready for the kilns."

WEST WHEAL TOLGUS.

A two-monthly meeting of adventurers was held at the mine on Wednesday, Mr. R. TAYLOR presiding. The account was a most satisfactory one, showing on the debit side—labour cost for the two months ending Jan. 7, 1646/- 9s. 5d.; merchants' bills, 1239/- 3s. 5d.; charged on account of 13th month, 150/-; making 3035/- 12s. 10d. On the credit side there was by copper ore sold, 558½ tons, 355/- 0s. 1d.; less dues 140/- 9s. 6d.; total credits, 3756/- 3s. 7d. The balance in favour of the adventurers from the last account was .092/- 5s. 8d., and on the past two months' working, 721/- 0s. 9d., making a total available balance in favour of the adventurers of 1813/- 14s. 8d. The account was unanimously agreed to, and it was determined to declare a dividend of 25s. per share. It was stated that the ore sold for the next two months had realised, after deducting the dues, the amount of 3543/- 5s. 3d. This, it was calculated, would leave the mine abut 65/- profit. The agents had also sampled 228 tons of ore for another two months, and the repairs of Taylor's engine pitwork, which was referred to at the last account, had been satisfactorily completed, and had produced a very good effect on the engine.

Capt. TONKIN, referring to an item of 9/- in the labour costs, asked where that had gone?—THE CHAIRMAN replied that it was absorbed by the London office expenses and the agent's salaries. Whilst speaking upon this he might say that there was an expression of opinion at the annual general meeting that the staff were not paid a sufficient remuneration. And the managers of the mine did not think they were paid enough, although they did not at present intend to ask for any more; but if, as they expected, they did get a good lode in the 132, then they might, probably, ask for an increase.

Capt. TONKIN stated that he had known the agents for a considerable time, and he agreed that they were not paid enough; but, as there was a question as to the 132 lode, they had better let the matter rest until the next quarter.

Capt. JAMES raised a little discussion by enquiring into the prices paid for old and new brass, being informed that they were 2d. per lb. for old and 1s. 3d. for new.

Other enquiries were made as to the price of coal and materials sent into the mine, and these having been satisfactorily answered by Major HAYZ, the meeting terminated.

VAN RAILWAY.

A general meeting of shareholders was held at the offices, Austin-friars, on Tuesday, Mr. A. R. BOUGHTON-KNIGHT, Vice-Chairman, presided.

The report of the directors stated there has been expended on capital account 74/- 4s. 3d., making the amount indebted to revenue 1142/- 4s. The net revenue account shows a profit of 525/- 3s. 1d., or 14/- 7s. more than in the corresponding period of 1874; this amount, added to the balance of revenue account at Mid-summer, makes 1807/- 0s. 9d. The directors propose to pay a dividend for the half-year at the rate of 4 per cent. per annum, which will absorb 400/-, and leave a balance of 1407/- 1s. 9d. applicable to the redemption of the sum of 1142/- 4s. disbursed in excess of paid-up capital.

THE CHAIRMAN moved the reception and adoption of the report and accounts. There were some hopes that the traffic of the line would be increased by the improving prospects of East Van; there were one or two questions in connection with East Van which would have to be considered and arranged when they held the Van meeting on the mine.

Mr. PAGE seconded the proposition, which was put and carried.

THE CHAIRMAN proposed that a dividend be declared at the rate of 4 per cent. per annum.—Mr. JULIUS AILINGSTON seconded the proposition, which was put, and carried unanimously.

A vote of thanks was passed to the Chairman and directors, which concluded the proceedings.

SOUTH CROFTY MINING COMPANY.

A three monthly meeting of adventurers was held at the mine on Monday.—Mr. RODD (the purser) presiding.

The accounts showed a loss on the three months' working of 239/- 3s. 11d., and the balance from the last quarter being 987/- 1s. 5d., showed a total balance of 1256/- 5s. 4d. against the adventurers.

The PURSER said the loss sustained during the past three months was in a great measure to be attributed to the fall in the price of tin and arsenic, and if it had not been for that fall the mine would have almost made a profit. He was sorry to meet the adventurers under circumstances of depression, there having that day been another fall of 2/- per ton. The reduction in the price of coal was, on the contrary, very satisfactory, having decreased from 26s. to 17s., and the quality of the coal with which they were now being served was very good. The balance against the mine was rather a startling one, but they could not help it; the adventurers must blame the tin market and not the mine, which was doing its best in every way. Some of the adventurers were ready and desirous to pay off the adverse balance by one call, but his own opinion was that, for the present, a call of 10s. would be sufficient to meet the exigencies of the case.

The accounts were passed, and a call of 10s. per share made.

Capt. THOMAS stated that this was the only call that had been made during the past twelve months, after all these times.

[The PURSER stated that circumstances of a private nature connected with his family, which involved a trusteeship, rendered it impossible for him to continue the pursership of the mine, and he, therefore, resigned the office.

A vote of thanks was unanimously accorded to the purser for the satisfactory and efficient manner in which he had discharged his duties, and Mr. WHEAR then moved that Mr. Henry Lean, the accountant, be elected to the office of purser, at a salary of 10 guineas per month.—Mr. HARRIS seconded the motion, and it was agreed to with unanimity.

Mr. WHEAR asked what amount of dues they were now paying, and was informed by Capt. Thomas that it was 125th. It was generally agreed that, looking at the present depressed state of mining, this was a very heavy amount to pay, and it was determined to apply to the lords for a reduction of the dues.

Capt. THOMAS, in answer to a shareholder, said he could not state for certain that they had cut through the East Pool lode, although he believed that they had. It must be the lode, or some connection with it, as the stuff was so very good.

Mr. W. H. RULE drew attention to the present system of the supply of coal, and stated that he was the agent of a company who would undoubtedly deal with them much better and cheaper than they were now being supplied.

Mr. RULE said the supply of coal to any mine should not be confined to any one company, but should be thrown open, so that all merchants should have an opportunity of competing for a supply. The present system was one of monopoly, and had a most depressing effect upon mining.—Mr. LEAN stated that during the past quarter the mine had been supplied with coal from four different merchants.

The PURSER contended that something was due to the Portreath Company for the liberal and generous manner in which they had acted towards the mine. They were very much obliged to any person interested in the coal supply for agitating the question as to bring the price down, and he dare say Mr. Rule had succeeded in doing so—(hear, hear)—and he was very much obliged himself for such aid and assistance, but at the same time they should not on small and trivial mat-

ters quarrel with their friends.—MR. RULE: If a man succeed in bringing down the price he should be patronised a little sometimes. (Hear, hear, and laughter.)

MR. REED (Penzance) asked whether they could not get the mine supplied by contract?

MR. RULE: I will engage to provide all the coal required for the mine, pump out the water, and pay the engine-men, at a saving of 20/- per month to the mine, and to do this I will enter into a contract for 12 months, and produce a guarantee for 1000/- for carrying out my contract. If it cannot be done one way it can be done another, and I am ready to sign a contract with the agents to do the work by 20/- a month less than it is now being done.

Capt. THOMAS said he could not average what his cost might be in the direction named during the next 12 months, so that he did not see his way clear to enter into a contract of the kind.—MR. D. PEARSE pointed out that the serious point of consideration here was whether, supposing the price of coal fell to any extent during the year, Mr. Rule would reduce his contract accordingly?—MR. RULE said he offered to take the contract in ignorance as to whether there would be a fall in the price, and he considered that where an offer to effect a saving of 60/- a quarter was made, the adventurers would study their interests if they accepted it.

MR. HARRIS agreed that it was a matter worthy of serious consideration, but desired that the matter should stand over for another quarter, when the agents probably would be in a better position to say whether or not they would accept such a contract.—MR. REED suggested the desirability of advertising for a contract for six or twelve months.—MR. RULE: I will take it for six months or three months.

MR. REED: I think it is worthy the consideration of the adventurers.

MR. RULE: There are friends of mine who have a heavy stake in collieries, and who would take up the supply of coal in this way. It is their object to send coal into this district, and if they cannot do so by the ton they will do it by contract by the month.—Capt. THOMAS said he would accept the offer in a moment if he thought it would be a saving, but as he could not see what would be the price of coal in the next six months he did not like to bind himself as was desired.—MR. RULE said his offer was open to be taken up, and he was ready at any time to enter into the contract, and give any reasonable security.—*Western Daily Mercury.*

*For remainder of Meetings see to-day's Journal.

stone to be conveyed direct from the shafts to the crushing mills, and thence directly to the jigger; the whole process of dressing being reduced to the extremely low cost of about 5d. per ton. The magnitude of the operations and concurrent advantages may also be further estimated from the fact that during the 14 years of the existence of the mine it has returned nearly 1,000,000/- sterling in dividends, besides continuously employing large numbers of miners and others, the present mining enterprise in South Australia owes its prosperity to any one thing more than another it is to this patent jigger for dressing low-class ores. Excepting at the Burra, where a lode of fine peacock ore has just been opened at the 78 fm. level, important discoveries in any of the mines have been recently reported, but the work of exploration is carried on with unabated vigour, rich deposits of Advertiser, Dec. 31.

IMPROVEMENTS IN MOULDING.—Some improvements have been made in apparatus for forming the moulds in which toothed wheels or other circular articles are to be moulded by Messrs. BILLINGTON and DARBYSHIRE, of Blackburn, the object of the invention being to dispense with the use of geared wheels as, owing to the play between the teeth, they cannot be relied upon to hold the moulding box in the exact position required relatively to the pattern. This is effected by adapting to the moulding table a perforated dividing ring, which is fixed above the periphery of the revolving table, and arranged to operate in connection with a locking device. The ring is made to answer the same purpose as the dividing plate on a wheel cutting machine, and to this end it is provided with a series of sets of holes in parallel lines around its periphery. The table is held firmly in the required position by means of a screw, pin, or other locking device, the end of which engages with the holes in the dividing ring, and after each tooth of the wheel has been moulded the screw or pin may be withdrawn until the next hole in the dividing ring has been brought opposite to it by the turning of the table. To be again held in position during the moulding of the next tooth. Another part of the invention consists of improved arrangements for striking or smoothing the tops and bottoms of moulds for such like circular articles. In conjunction with the striking apparatus a gauge or pointer is employed, made of metal in stead of wood, as ordinarily employed, and capable of being adjusted by means of screws to any required diameter of mould. The inventors also claim the making of the segmental patterns used in moulding machines of smoother surface and more durable than heretofore, by coating them with a composition consisting of mastic, resin, red-lead, shellac, and painters' finish. The use of this coating renders all material from which to make the patterns other than wood or metal, as ordinary used, more especially certain kinds of cements, such as plaster of paris, Portland, and Roman cement, which may be formed into patterns by the use of suitable

stone to be conveyed direct from the shafts to the crushing mills, and thence directly to the jigger; the whole process of dressing being reduced to the extremely low cost of about 5d. per ton. The magnitude of the operations and concurrent advantages may also be further estimated from the fact that during the 14 years of the existence of the mine it has returned nearly 1,000,000/- sterling in dividends, besides continuously employing large numbers of miners and others, the present mining enterprise in South Australia owes its prosperity to any one thing more than another it is to this patent jigger for dressing low-class ores. Excepting at the Burra, where a lode of fine peacock ore has just been opened at the 78 fm. level, important discoveries in any of the mines have been recently reported, but the work of exploration is carried on with unabated vigour, rich deposits of Advertiser, Dec. 31.

SIGNALLING ON RAILWAYS.—Experiments are, it is understood, about to be made with the improved automatic signalling apparatus invented by Mr. H. E. Skinner, of Kensington, some three years since, with the object of ensuring communication with the guard and driver of a train when, from any cause whatever, the ordinary semaphores and lights are invisible to them. The invention consists in placing inclined planes either outside or inside the rails and affixing to the engine a lever or pendulum, which is operated on passing over such inclined planes, thereby sounding the steam-whistle and shutting off the steam. It is proposed to place the inclined plane under the control of the railway officials by means of wires and levers as at present, so that the inclined plane can be raised or lowered at discretion. When lowered the apparatus on the engine is not acted upon. The inclined plane can be placed at any distance from the signal-box or station to suit the circumstances of each particular case, and it is proposed also to use portable inclines to replace for signals. The development of the invention is looked forward to with much interest.

ARTIFICIAL FUEL.—According to the invention of Mr. J. A. H. of Amsterdam, artificial fuel blocks are prepared by compounding together tar and peat and small coal, or coal dust with coal tar and river deposit. The peat and coal dust are first ground into fine paste which are then mixed with the other ingredients, and the compound is compressed in moulds.

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HOLLOWAY'S OINTMENT AND PILLS.—The present inclement season should teach us caution: exposure to its influence, combined with confined atmospheric closed and heated rooms, frequently lays the foundation of evils which must be once attacked before serious mischief be brought about: We are all apt to be easily taken in, and what at first sight may appear to be only a slight cold, may perhaps eventually terminate in some formidable malady. On the first appearance of anything of the kind this ointment should be applied (after fomentation and according to the directions) to the chest and throat. This alone will afford great relief; but to doubly secure oneself, the pills should be simultaneously taken. This will confirm the cure.

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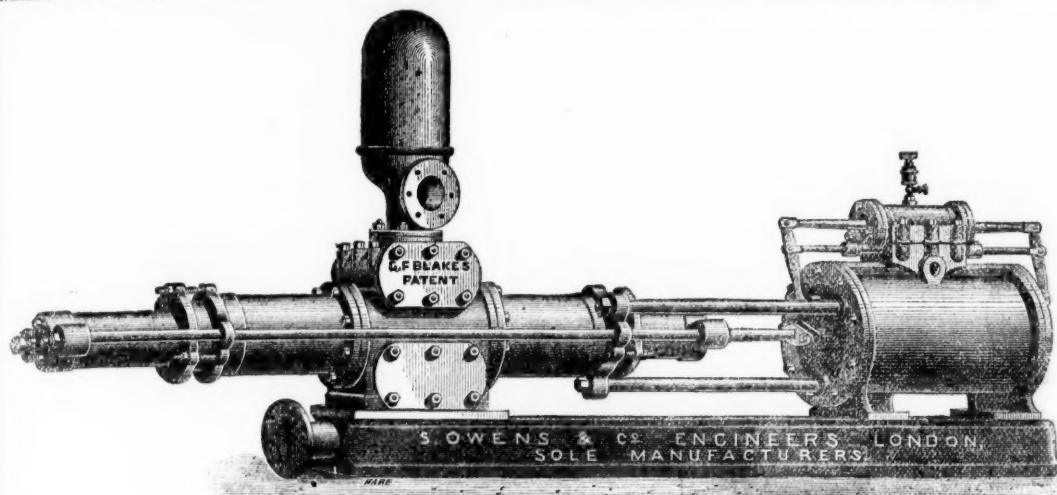
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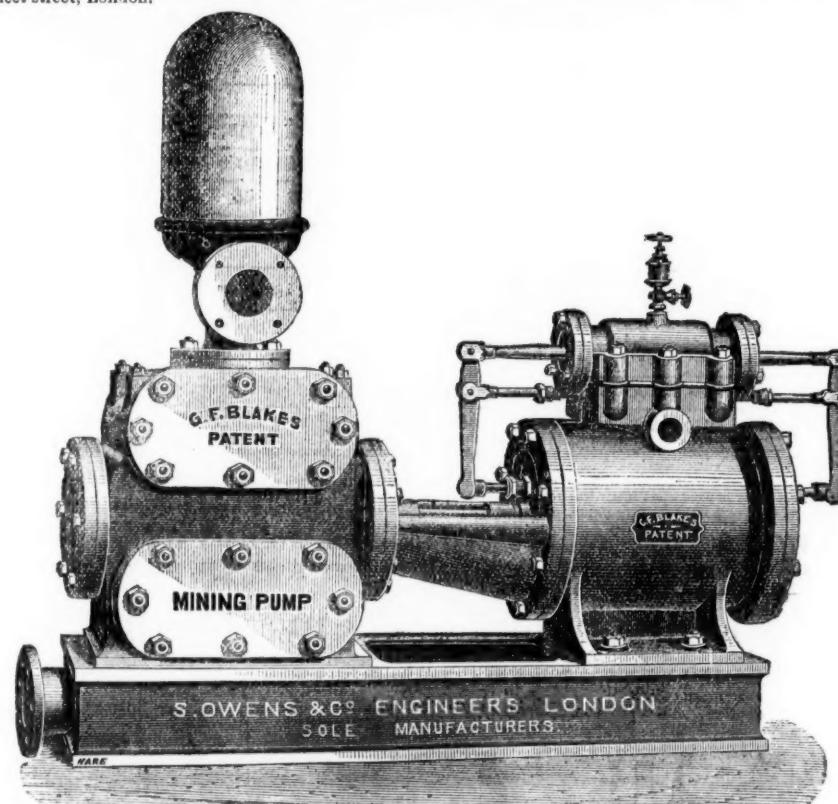
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Length of stroke, In.	18	18	18	24	24	24	24	24	24	24	24	24	30	30	30	30	30	36	36	42	
No. of strokes per minute.	30	30	30	25	25	25	22	22	22	22	22	22	22	22	20	20	17	17	17	15	
Quantity in gallons per hour, approximately ...	1440	2610	4200	5910	2940	4620	6600	2046	4158	5940	10620	2646	5160	7500	13260	4586	9000	12360	15660	6720	120

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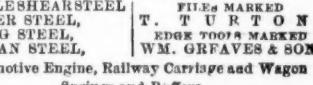
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PARIS EXHIBITION, 1867.



VIENNA EXHIBITION, 1873.



LONDON EXHIBITION, 1874.



CORNWALL POLYTECHNIC SOCIETY, 1867 and 1873.

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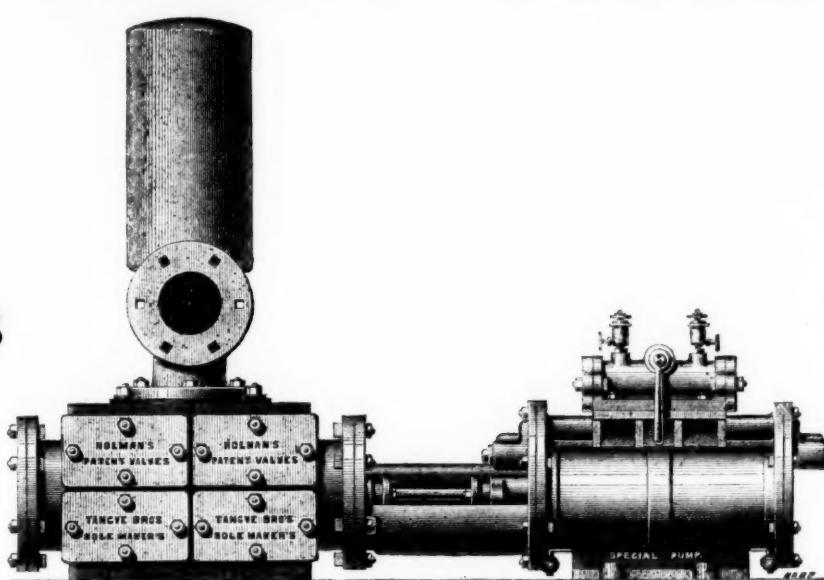
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ARE IN USE IN

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200 SIZES

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The "Special"
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MADE FOR EVERY VARIETY
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GREAT REDUCTION IN PRICES.

The following sizes are suitable for low and medium lifts:—

Diameter of Steam Cylinder ...In.	3	4	4	4	5	5	5	6	6	6	6	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	11					
Diameter of Water Cylinder ...In.	1½	2	3	4	3	4	5	3	4	5	6	3	4	5	6	7	4	5	6	7	8	5	6	7	8	9	5	6				
Length of Stroke	In.	9	9	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	18	12	12	12	18	24	12	12				
Gallons per hour		680	815	1830	3250	1830	3250	5070	1830	3250	5070	7330	1830	3250	5070	7330	9750	3250	5070	7330	9750	13,000	5070	7330	9750	13,000	16,519	5070	7330			
Price	£	16	18	20	25	22	10	27	10	32	10	25	30	35	40	30	35	40	45	50	40	45	50	55	65	50	55	60	70	85	55	60

CONTINUED.

Diameter of Steam Cylinder..In.	10	10	10	10	12	12	12	12	12	12	14	14	14	14	14	14	14	16	16	16	16	16	16	16	18	18	18	18	18							
Diameter of Water Cylinder..In.	7	8	9	10	6	7	8	9	10	12	7	8	9	10	12	14	8	9	10	12	14	9	10	12	14	9	10	12	12	12						
Length of Stroke	In.	12	18	24	24	18	18	18	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24						
Gallons per hour		9750	13,000	16,519	20,000	7330	9750	13,000	16,519	20,000	30,000	9750	13,000	16,519	20,000	30,000	40,000	13,000	16,519	20,000	30,000	40,000	16,519	20,000	30,000	40,000	16,519	20,000	30,000	40,000	16,519	20,000	30,000			
Price	£	55	75	90	100	75	80	85	110	120	140	110	120	130	140	160	180	140	150	160	180	200	190	200	220	240	240	240	240	240	240	240	240	240	240	240

Intending purchasers of Steam Pumps would do well to observe the great length of stroke, short steam cylinder, and short piston of the "Special" Steam Pump, as compared with the short stroke, long steam cylinder, and long piston of the Pumps of other makers, as the efficiency and durability of the machine, and the space occupied by same, greatly depend upon this. The advantage of long strokes will be obvious when purchasers are reminded that each set of suction and delivery valves of a "Special" Steam Pump with 24 in. stroke, running at 120 ft. per minute, would open and close only 30 times per minute, as against 120 times per minute in a Pump with only 6 in. stroke performing same duty.

The "Special" Steam Pump can be worked by Compressed Air as well as by Steam.

HUNDREDS of these PUMPS are USED for HIGH LIFTS IN MINES, for which purpose they are made with 21, 24, 26, 28, 30, and 32-inch Steam Cylinders, and 36, 48 and 72-inch Strokes.

Holman's Patent Self-acting Exhaust Steam Condensers.

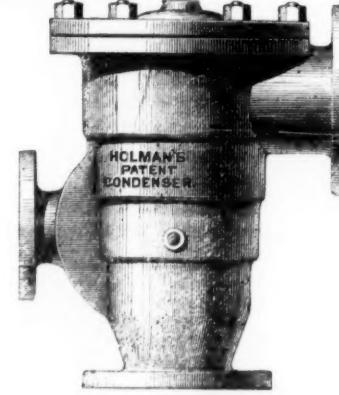
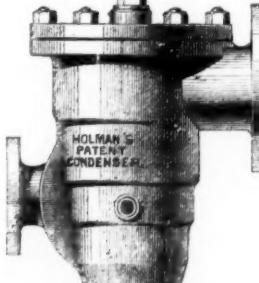
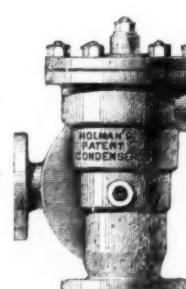
FOR ALL KINDS OF STEAM PUMPS AND HIGH-PRESSURE STEAM ENGINES.

TURNS WASTE STEAM INTO
GREAT POWER.

Saves 20 to 50 per Cent of Fuel.

QUIRES NO THREE-WAY COCKS,
CHECK, or REGULATING VALVES.SAVES HALF ITS COST IN PIPES AND
CONNECTIONS.PREVENTS ALL ESCAPE OF STEAM IN
MINES OR ELSEWHERE.

REQUIRES NO EXTRA SPACE.



These Condensers are made to suit any size and kind of Steam Pump. They form a part of the suction pipe of the Pump, and while they effectually condense the exhaust steam, they produce an average vacuum of 10 lbs. per square inch on the steam piston, increasing the duty of the Engine, and effecting a saving in fuel of from 20 to 50 per cent.

In Mining operations these Condensers will be of great value.

All Boiler Feeders are recommended to be fitted with these Condensers, as not only is the exhaust steam utilised in heating the feed water, but is returned with it into the boiler.

The following Testimonial gives one Example of the Power Gained by the action of Holman's Patent Condensers:—

MORLEY COLLIERY, WIGAN, October 10th, 1874.

Messrs. TANGYE BROTHERS AND HOLMAN.

GENTLEMEN.—I have great pleasure in recording my entire satisfaction with the working of the Holman's Patent Steam Pump Condenser which you have supplied to us. The complete condensation of the steam is, apart from its value in the strict economic sense, a most valuable feature in the drainage of underground work-

ings. The perfect manner in which this important result is accomplished by your Condenser is extremely creditable to you, and merits the thanks and commendation of the Mining Engineer. When we start the "Special" Steam Pump the Condenser commences working automatically, and maintains a constant vacuum of 10½ lbs. per square inch, even when we run the Pump upwards of 80 strokes (106 feet) per minute. It may perhaps be interesting to you to know that when we were running the Pump at 84 strokes (108 feet) per minute, the steam gauge

indicating a steam pressure of 36 lbs. per square inch, 80 yards from the Pump, and the Condenser vacuum gauge on the exhaust pipe indicating a steady vacuum of 21½ inches, I turned the exhaust steam from the Condenser into the atmosphere, when the speed at once fell to 44 strokes per minute. The working economy thus shown is really so great that the cost of the Condenser must be saved in a very short time.

(Signed) J. THOMPSON.

Price from 30s. to 40s. per inch diameter of Steam Cylinder, according to the relative Diameter of Pump for which Condenser is required.

PATENT IMPROVED ORE WASHING & DRESSING MACHINES.

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HUNDREDS IN USE.

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Will supply Designs, and all the necessary Plant for laying out Dressing Floors; also

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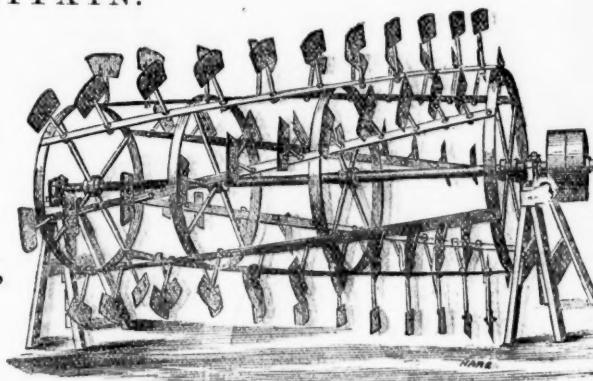
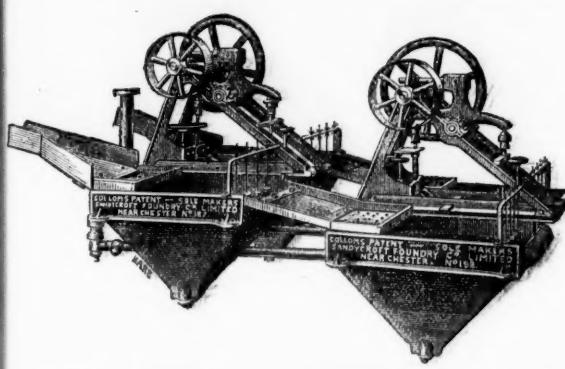
PUMPING & WINDING ENGINES,

PITWORK, CRUSHING MILLS,

ROLLS

OF PEGLIARILY HARD AND TOUGH MIXTURE,

&c., &c.



COLLOM'S PATENT AUTOMATIC ORE WASHING MACHINE, working at the following and many other Lead, Copper, Blende, and Tin Mines:—Great Laxey, Cape Copper, Pontgibaud, Linares, Alamillos, West Tolgus, Lisburne, Minera Halvans, Snailbeach, &c.; and also at Messrs. Vivian and Sons' Works, Swansea.

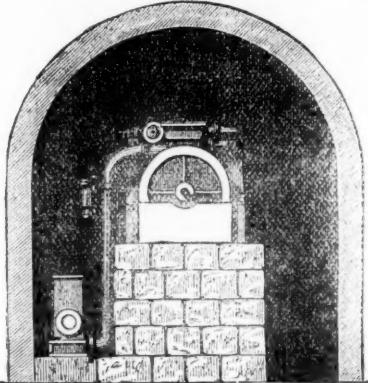
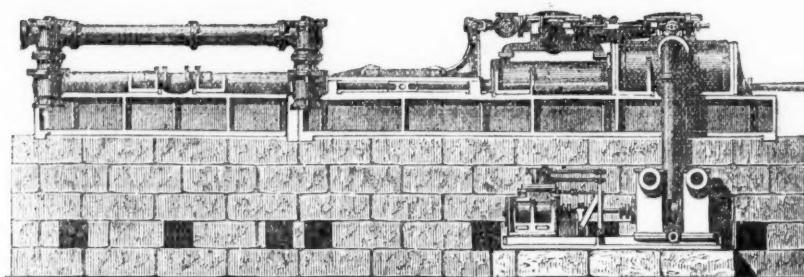
PATENT IMPELLER, OR KNIFE BUBBLE, in use at the following and many other Lead, Copper, Blende, and Tin Mines:—The Van, Roman, Gravels, Tankerville, Ladywell, Lisburne, East Black Craig, Old Treburgett, Penhale & Barton, Bogg, Linares, Fortuna, Alamillos, Minera Halvans &c.

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THE COMPOUND DIFFERENTIAL ENGINE AND FORCE PUMPS,

With Separate Condenser, as applied Underground, forcing 700 gallons per minute 920 feet high.

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FURTHER PARTICULARS ON APPLICATION

CHAPLIN'S PATENT STEAM ENGINES AND BOILERS,

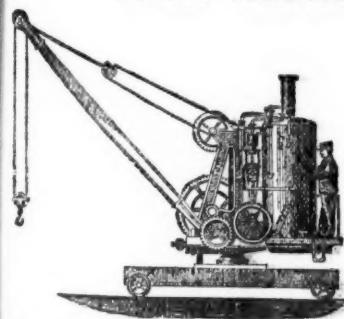
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For Tunnels, Mines, Quarries, AND OTHER WORKS.



Intending purchasers can satisfy themselves that the advantages claimed for the "CHAMPION" over all other Rock Borers are not over-estimated.

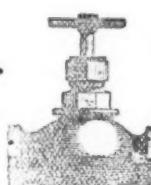
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IMPROVED AIR COMPRESSORS,
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For WATER SUPPLY to TOWNS, LAND IRRIGATION, and MINERAL EXPLORATIONS, may be executed of any diameter, from 6 in. to 36 in., and to any depth to 2000 ft.,
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Improved Valves and Taps for Water, Steam, Gas, &c.
PATENT STEAM EARTH-BORING MACHINE
ENGINEERS and MACHINE MAKERS to CALICO PRINTERS, BLEACHERS, DYERS, and FINISHERS.

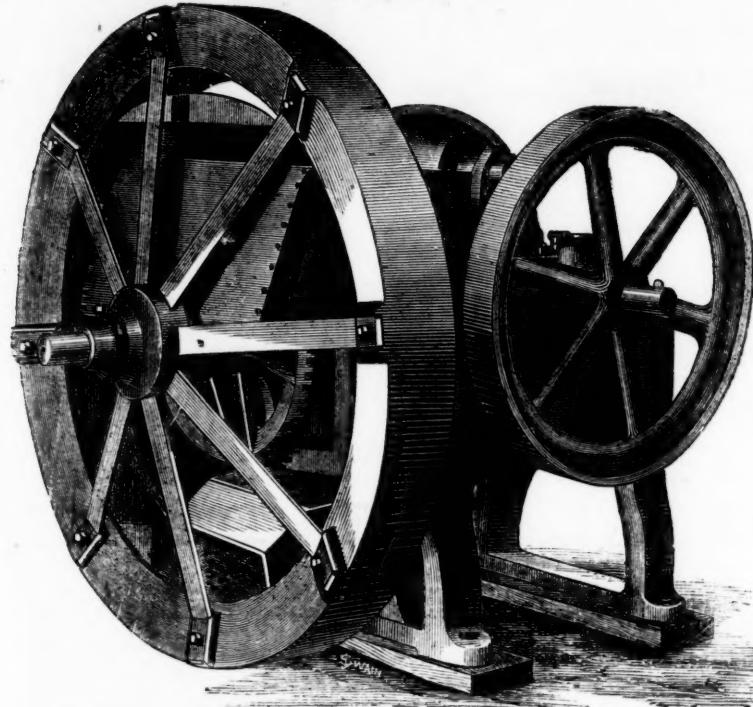
SALFORD IRONWORKS, MANCHESTER.
PRICES AND PARTICULARS ON APPLICATION.



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New Patent Crushing Jaws,
EXTENSIVELY USED BY
MINE OWNERS, &c.
OVER 1150 NOW IN USE.

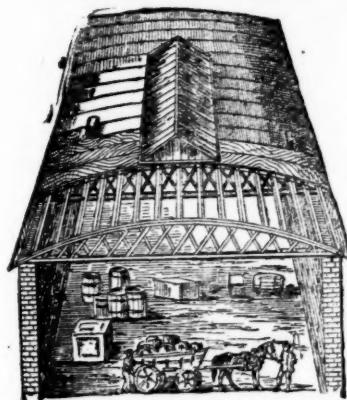
New Raff Wheel Machine, fitted with H.R.M.'s Special Jaws for Crushing Stone, &c. to
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The above drawing shows the construction of this cheap and handsome roof, now
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of which are double bow and string girders of best pine timber, sheeted with $\frac{1}{2}$ in.
boards, supported on the girders by purlins running longitudinally, the whole
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They can be made with or without top-lights, ventilators, &c. Felt roofs of any
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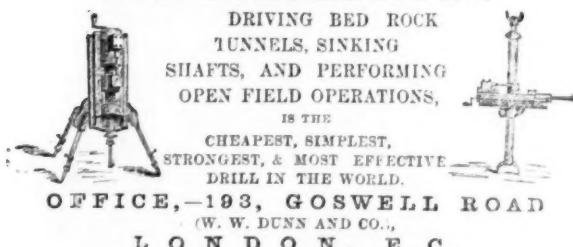
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Wholesale buyers and exporters allowed liberal discounts.

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DRIVING BED ROCK
TUNNELS, SINKING
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IS THE
CHEAPEST, SIMPLEST,
STRONGEST, & MOST EFFECTIVE
DRILL IN THE WORLD.
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* PUMP LEATHER *
WATERPROOF

By a special method of preparation, this leather is made solid, perfectly close in
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It may be had of all dealers in leather, and of —
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MANUFACTURERS,
LONG LANE, SOUTHWAKE, LONDON
Prize Medals, 1851, 1855, 1862, for
MILL BANDS, HOSE, AND LEATHER FOR MACHINERY PURPOSES.

H. R. MARSDEN, LEEDS,

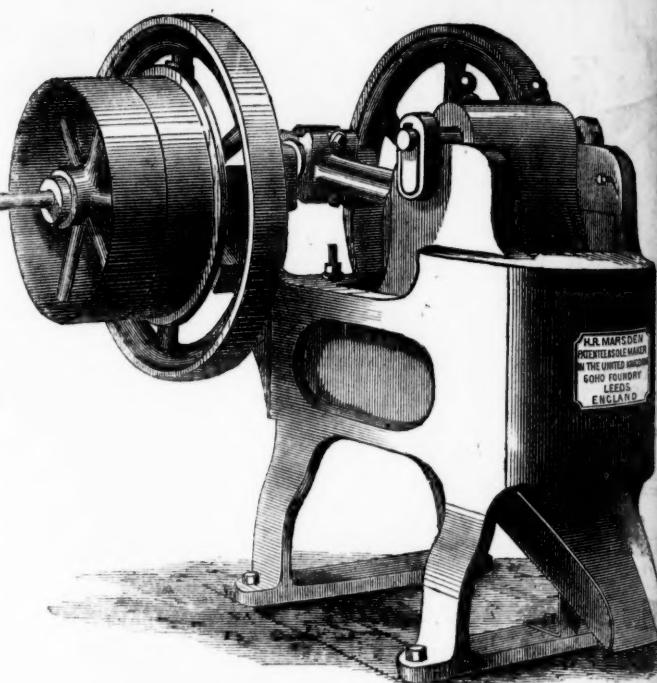
PATENTEE, AND ONLY MAKER IN THE
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Great Improvements in Mining
Machinery by the use of
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NEW RAFF-WHEEL MACHIN

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BY WHICH ORES OF EVERY DESCRIPTION CAN
BE REDUCED TO FINE POWDER.



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Stone Breakers.

Machines fitted with
H. R. M.'s renowned
PATENT CRUSHING
JAWS, by which stone
is broken equal to hand
at ONE-TENTH THE
COST.

FEW WORKING
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SMALL WEAR and
TEAR.
SIMPLICITY OF
CONSTRUCTION, &c.

THE ONLY ORE
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COMBINE AND EMBRACE THE TRUE
PRINCIPLES OF AC
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PURPOSE
DESIGNED.

PUNCHING & SHEARING MACHINES,

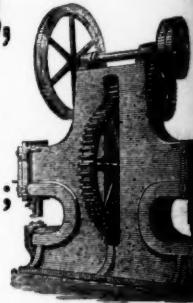
Suitable for Collieries, Shipbuilders, Boiler Makers,
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Slotting Machines; Shaping Machines;

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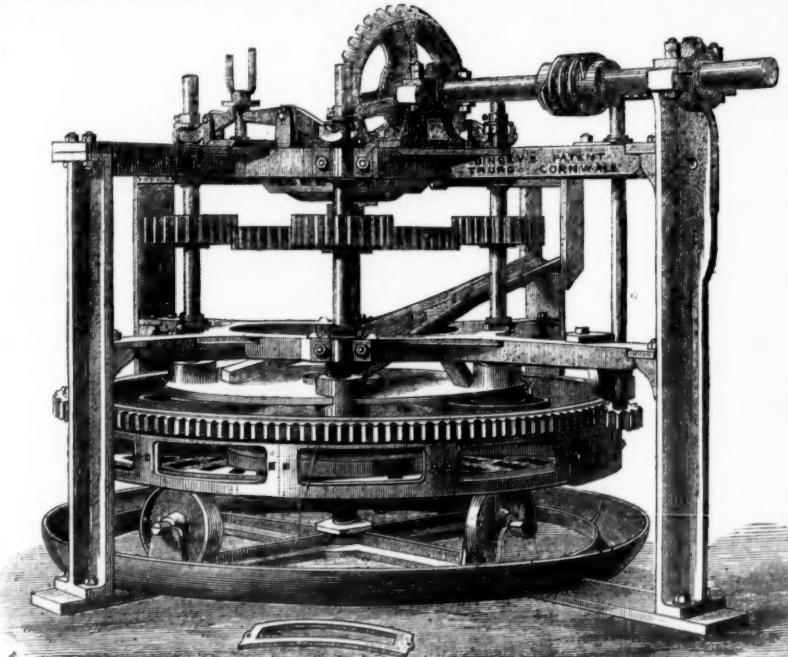
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First Silver Medal, Royal Cornwall Polytechnic Society, awarded 1870.
Special Premium of £20, offered conjointly by the Editor of "Mining Journal" and the Royal Cornwall
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This Machine is specially adapted for GRINDING TIN ROWS, LEAD SKIMPINGS, GOLD and SILVER ORES, &c. LOW
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This Pulveriser is working at Carn Brea, Tincroft, Wheal Jane, Frank Mills (Lead), and various other Mines.

TESTIMONIALS.

I have used Dingey's Patent Pulverisers for some time, and am pleased to say they answer to my entire satisfaction; it is, therefore, with great pleasure I
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The Pulveriser answers admirably, and we are satisfied it is the most efficient Machine extant for treating halvans, &c. Please send on the other two as quickly
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